



Michigan 511

Implementation Plan

Prepared for:



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EXECUTIVE SUMMARY

The Michigan Department of Transportation (MDOT) is leading development of a Strategic Plan and Implementation Plan for a statewide 511 service in Michigan. 511 is a three-digit abbreviated dialing code assigned by the Federal Communications Commission for the purpose of providing traveler information. This code was assigned to government agencies, and provided a three-digit number that could replace the numerous local and toll-free numbers for road and travel conditions throughout the country. Implementing and operating 511 services remains a local and/or state responsibility.

Relationship of Traveler Information Systems and Sources

MDOT's vision for its statewide traveler information program includes both phone and web-based components. MDOT currently operates several hotlines for road construction, and these are manned by the individual MDOT regions. Phone based traveler information in Michigan is also available from AAA Michigan, and the Michigan State Police operate a winter weather advisory hotline. The 511 planning effort has focused on developing a vision for a statewide service that would integrate road closure and restriction information, incident information, and weather to provide a comprehensive service for travelers. This information would be provided for MDOT roadway facilities throughout the state. In the metropolitan areas where freeway management systems can provide more detailed congestion and travel time information, this would be integrated with the closure and incident information. 511 is also a valuable tool for providing emergency alert information, such as widespread weather impacts, AMBER alerts, or traffic conditions information for major special events.

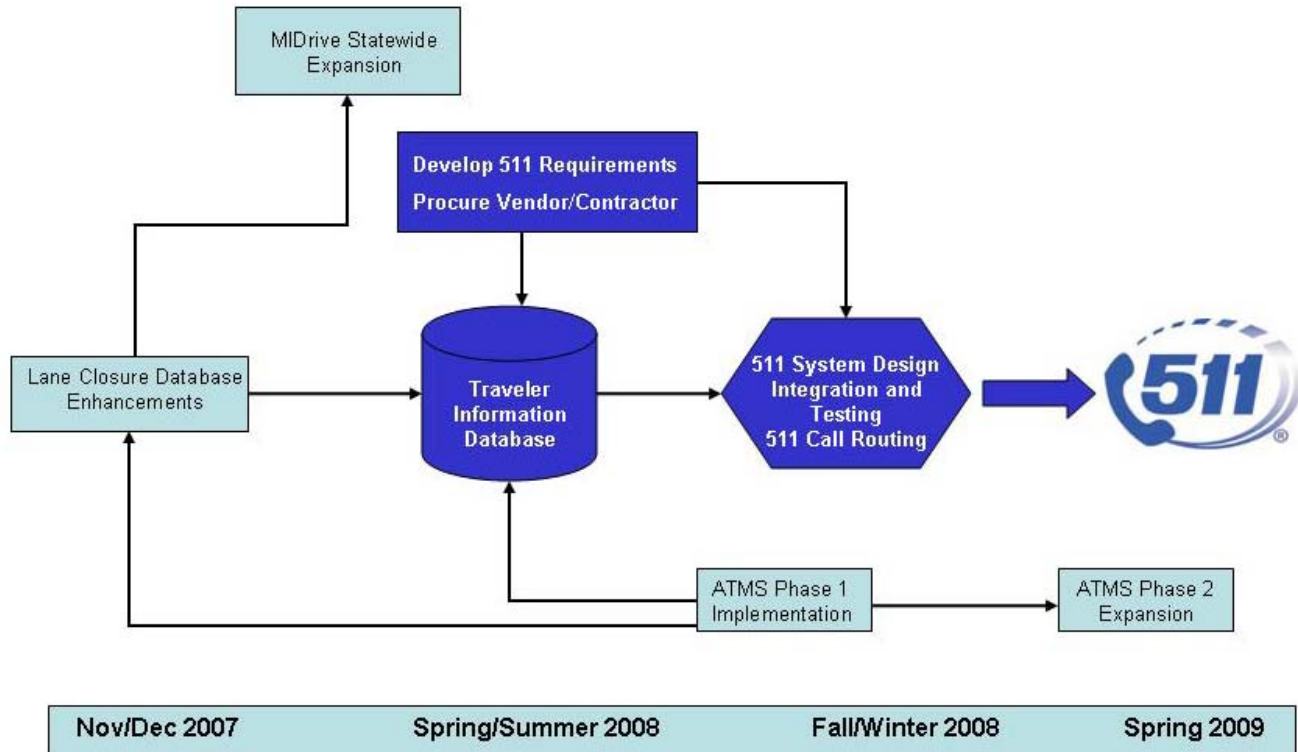
Traveler information is also available from MDOT via the internet. MDOT's current web site includes planned construction and restrictions for Interstate and State highways, as well as US routes. Presently, this information is not linked to a map; users can select a region and corridor from a drop-down menu list. A statewide map is provided with planned construction activity for that year. Links include border crossing information, Detroit area traffic, and the Michigan State Police winter weather advisory page (during winter months).

Michigan's 511 phone service would build upon key activities underway through MDOT as well as the Michigan Department of Information Technology (DIT). Two key efforts are underway that will provide a significant foundation for an enhanced traveler information program in Michigan:

- Enhanced statewide Lane Closure Database, linked to a geo-coded map, to provide improved and consistent information for planned lane closures, impacts, construction and restrictions; and
- MIDrive web site, which is initially providing detailed congestion, incident and travel conditions information for the Detroit metropolitan area, but DIT is planning to expand this web site statewide.

Phasing and timing of a 511 service would build on these two efforts, as well as a third key initiative. Planning and development of an ATMS software program is underway; this ATMS would replace the system currently used to manage and monitor the freeway operations system in Detroit. A Phase 1 ATMS roll-out is envisioned for the Grand Region, and ultimately will be expanded statewide. This would provide real-time traffic conditions information to both phone and web traveler information services, in addition to serving as a powerful tool for MDOT's statewide transportation system management.

The relationship and phasing of these critical components is illustrated in the following figure. A phased approach is recommended to allow time to build and implement the foundation data source (enhanced Lane Closure Database), as well as focus on the statewide expansion of the MIDrive web site.



511 Content and Information Sources

An initial system for Michigan's 511 service will focus on four core content areas, as shown in the table below. These would provide Michigan travelers with incident, construction, weather impacts on a statewide basis, and available congestion information in the metro areas. With these available data sources, there will be a consistency of information provided on both the 511 phone and expanded MIDrive web systems.

Information Type	Source and Status
Planned closures, construction activities and lane restrictions (statewide)	MDOT lane closure database. MDOT is currently developing an enhanced version of its statewide database; expected launch early 2008.
Metro area traffic conditions and congestion (Metro and Grand Regions)	MITs Center data for Metro region. Existing software and system can provide metro area road/traffic conditions and incidents. A new ATMS system is planned, and Grand will be part of a Phase 1 roll-out; expected launch mid 2008.
Incidents on state highways	Michigan State Police and local law enforcement. Incident information outside of the Metro Region is not captured through an automated interface. Would require MDOT staff to enter incidents into lane closure database.
Weather	Michigan State Police winter weather advisory. Currently not automated, would require MDOT staff to enter into lane closure database. Forecasted conditions can be obtained from NOAA/National Weather Service and included with corridor reports.



As the service expands and as new data sources are available, it is envisioned that Michigan's 511 could include:

- Travel and tourism information
- Public transportation information
- Special event traveler information
- Links to neighboring 511 services

These would most likely be provided via a call transfer to external entities.

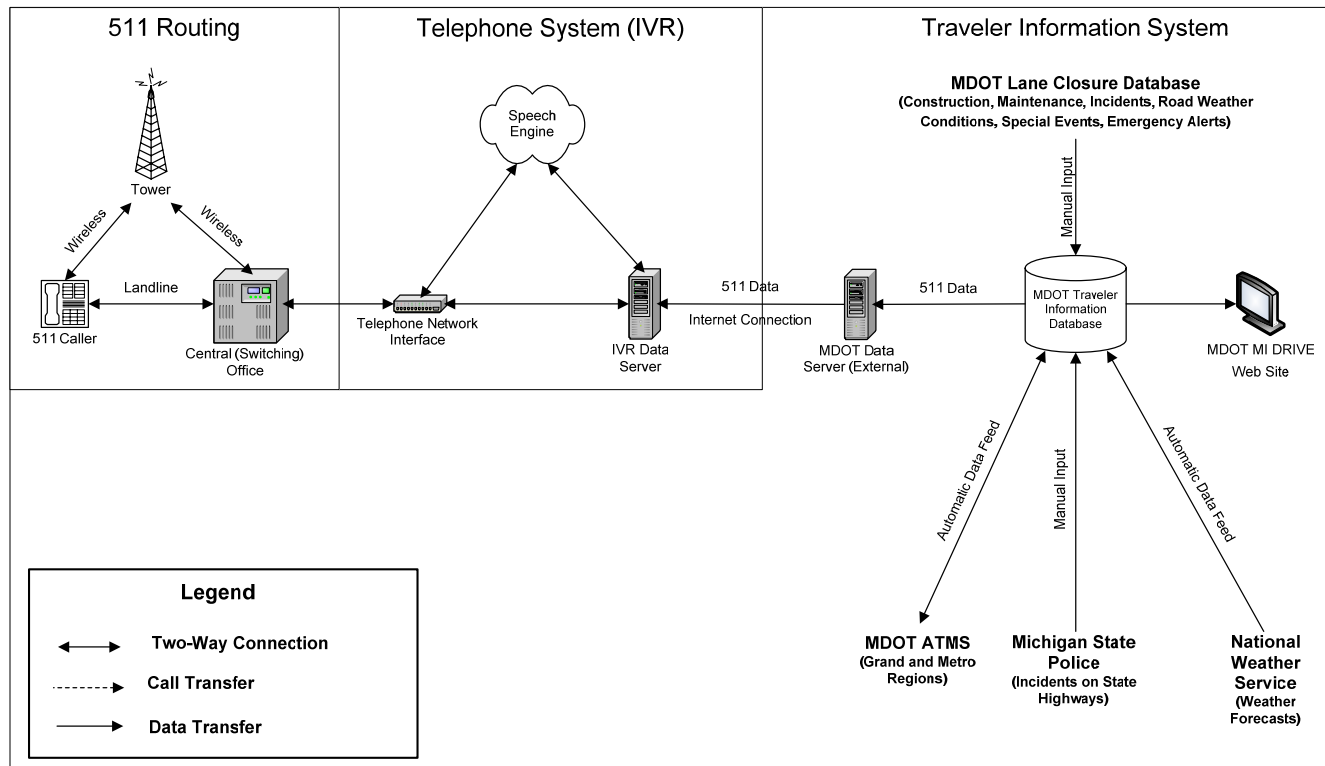
Michigan 511 Architecture and Recommended Configuration

The Statewide 511 Strategic Plan recommended that Michigan's 511 service be comprised of a contracted (hosted) network based telephony system, and use a hybrid centralized/distributed configuration. This recommendation was developed based on:

- Technical resources needed to develop the 511 Interactive Voice Response (IVR) system and interfaces to MDOT's data;
- Scalability of the contractor's network capacity to effectively respond to spikes in usage (largely due to winter weather);
- Ability to integrate new data sources as they become available; and
- Ability to leverage funding across implementation, operations and maintenance. By using a contracted option, MDOT will not have to allocate as much funding up-front for capital investment before the 511 service is operational and, as would be the case if a premise-based (in-house) solution was selected.

The proposed architecture and configuration for MDOT's 511 phone service consists of components that will be developed and maintained by a contractor as well as by MDOT. The following figure shows a prototype for an initial implementation of a 511 phone service in Michigan. This initial implementation assumes the lane closure database and initial phase of the ATMS would be part of the first roll-out of a 511 service. The components in the Traveler Information System group will all be developed and maintained by MDOT or MDIT. The private contractor will be responsible for the IVR/Telephone System, and call routing will need to be coordinated with landline and wireless carriers.

Call transfers are not envisioned to be a significant part of an initial service in Michigan, but will become increasingly utilized as Michigan's 511 service expands. At present, Michigan does not have any neighboring states with a 511 service, but Wisconsin, Indiana, Ohio, Illinois and Ontario are planning to implement a 511 service in the near future.



A future architecture is envisioned to include automated data feeds from Michigan State Police, broader implementation of the ATMS to include statewide systems, as well as automated inputs from Road Weather Information Systems (RWIS) weather sensors. Call transfers to transit, neighboring states, tourism/event information and others are feasible and should be considered.

Recommended Business Model and Partnerships

To effectively implement a statewide 511 service, it is recommended that MDOT serve as the lead agency for funding, development, implementation and operations. Although partnerships will be needed to support the service – such as for data, marketing and promotion – it is not likely that there will be sufficient funding from an outside entity to offset the operational costs of a statewide system.

Successful development and implementation of a 511 service will require involvement of several entities. For the initial system, key partners will include:

- Michigan DOT – Program management, oversight, administration, operations. Includes lead role for system development, design, and operations (via a contractor). Leadership role for marketing and promotion, as well as coordinating with other partners. MDOT regions will have responsibility for entering and updating information that feeds the 511 and MIDrive site.
- Michigan DIT – System development and support, coordination with contractor for interfaces to Michigan systems. Enhance and expand systems to provide statewide data. Manage MIDrive web site development and expansion.
- Telecommunications Association of Michigan – Telecommunications coordination and support.
- Michigan Public Service Commission – Review carrier tariffs.
- Private Sector Voice Hosting Contractor – Develop, implement and operate Michigan’s 511 service. Includes close coordination with DIT for interfaces to data sources.



- Michigan State Police – Provide incident data to MDOT, as well as AMBER alert information to include on MDOT’s traveler information systems.
- Local Law Enforcement – Provide incident data to MDOT (state and interstate highway incidents).
- National Weather Service/NOAA – Provide forecasted weather conditions and weather alert information.

As part of future expansions and enhancements of Michigan’s 511 service, additional partners could include: AAA Michigan, neighboring states, transit operators, County Road Commissions and other local agencies, border bridge crossings, as well as private sector traveler information providers.

Telecommunications Routing

MDOT will need to coordinate with landline and wireless carriers to enable 511 routing in Michigan. The 511 abbreviated dialing code will need to ‘point-to’ a toll-free number, and this number will need to be provided to landline and wireless companies to implement the needed programming and switching.

There are approximately 30 landline carriers and 13 national/regional wireless carriers that would need to implement 511 routing. MDOT will need to contact each carrier, obtain any agreements that may be required, and in some cases, may need to coordination with the Public Service Commission to review landline tariffs and issues.

There are some known issues for both landline and wireless 511 call routing:

Landline:

Landline routing is generally straightforward. Providers indicated the easiest call routing configuration is to route calls to a single statewide toll-free number. The larger carriers (Verizon, AT&T) will likely have tariffs that govern the routing cost/pricing structure, and these will need to be reviewed. Smaller carriers may be more amenable to implementing routing and programming at no charge. MDOT should also work with the Telecommunications Association of Michigan and the Michigan Public Service Commission to negotiate out any tariff language that prescribes monthly recurring charges. In terms of routing timeframe, it is recommended that MDOT initiate call routing coordination six months in advance of the target launch date. This will allow sufficient time for carrier programming and testing.

Wireless:

With the nature of wireless networking and the number of providers operating in Michigan, it is inevitable that there will be some wireless call routing issues and conflicts. Most wireless providers have agreed to route 511 calls at the switch level to one toll-free number per state – this is a consistent policy that they work with for 511 implementations around the country. Because wireless calls are generally routed at the switch level, callers in border areas may get routed to the 511 service of an adjacent state, or may not be able to access the 511 service at all.

The national wireless companies (T-mobile, AT&T, Sprint/Nextel, etc.) typically request that an agreement be in place between the DOT and the wireless company prior to them initiating any routing. If there are any costs associated with tower-level routing, those should be part of the agreement as well. Wireless companies typically require at least 30 days notice for routing; it is recommended that 90 days’ notice be provided to allow for system testing.

Wireless coverage is incomplete in some of the more rural portions of the state, especially the Upper Peninsula, so travelers in these areas may not be able to access 511 via a wireless phone.



Telecommunications costs:

Call routing fees and charges typically apply just to landline carriers, but depending on the precision of wireless routing needed, some wireless providers may request some level of cost recovery. MDOT should also allocate funding to cover any wireless routing charges that may result from tower-level routing. These charges will not be able to be fully determined until wireless providers begin the actual routing implementation. A budget of \$20,000 should be allocated to cover these potential charges. Because there are no active 511 services in any neighboring state, wireless bleed-over into other states may not be a significant issue in the near-term.

The most significant telecommunications costs will come from landline carriers. Early in the 511 Strategic Plan discussions, SBC (at the time the largest ILEC in Michigan) indicated a pricing structure that included monthly recurring charges. A March 2007 catalog filing by AT&T Michigan (f/k/a SBC) for 8-1-1 call routing was submitted to the Michigan Public Service Commission. In this filing, AT&T outlines a pricing structure that is \$253.02 per central office switch, without any recurring charges. This establishes a favorable precedent for a similar strategy for 511, and should be pursued by MDOT with the MPSC. Earlier discussions with SBC indicated a per-central-office charge of close to \$900, as well as monthly recurring charges.

The table below provides an estimate for call routing for Michigan. These numbers are based on information obtained specifically to 511.

Entity	Non-Recurring Charge	Annual Recurring Charge
Landline Carriers	\$ 230,000	\$ 20,000
Wireless Providers	\$ 20,000	\$ –
Total	\$ 250,000	\$ 20,000

If MDOT is able to negotiate more favorable terms with both AT&T and Verizon, costs for landline routing could be significantly reduced. Using the 811 precedent in Michigan, AT&T implementation costs could be closer to \$50,000. Verizon landline has approximately half of the number of central offices that AT&T has in Michigan, but their higher charge per central office results in close to the same dollar amount (\$48,000). This will result in approximately \$100 – \$125,000 for landline routing – almost half of what was initially proposed by these carriers.

Marketing and Outreach

Promoting awareness of the availability of 511 for traveler information in Michigan will be a critical element in the overall implementation and sustaining operations of the service. Michigan's marketing efforts should focus on the following key areas:

Media Relations Plan	Media is a very strong partner in helping MDOT to promote their traveler information tools. A formal launch is also part of the Media Relations Strategy. MDOT should include mentions of 511 and MIDrive with each media release for construction, closures or winter travel advisories.
Public Information and Awareness	These strategies include roadside signage, use of dynamic message signs to promote 511, as well as a combination of paid advertising and public service announcements. Paid media advertising should be used as part of the initial launch, but it is not recommended as a long-term strategy.



Partner Co-Promotion	MDOT needs to establish a network of partners that will help to promote 511 and MIDrive. These include tourism entities, the Michigan Trucking Association, city and county web sites, Michigan State Police and others who could include a link from their site to the MIDrive/511 information. Publicizing traveler information tools through ads or feature stories in these partners' publications will also help promote the service.
Collateral Materials	Collateral pieces such as rack cards, media kits, window clings, keychains and other promotional materials should be distributed statewide. MDOT can utilize its partner network to help distribute promotional information to hotels, attractions, welcome centers, airports and other venues.

Activities that could be considered “high impact/low cost” were preferred, meaning those activities that would be most likely to reach a large number of potential users at a reasonable cost. Many of these strategies encompass ongoing promotion of 511 and MDOT’s traveler information tools.

Cost information for marketing and promoting 511 as part of an initial implementation is shown below. MDOT should also budget \$25,000 - \$50,000 annually as part of its operations cost for ongoing marketing and awareness strategies.

Strategy	Quantities	Cost
Roadside Signage (designed, produced and installed)	50 @ \$750.00	\$37,500.00
Media Kit Folders	350 @ 10.00	\$3,500.00
Rack Cards (designed and printed)	100,000	\$7,000.00
Other collateral/printed material/brochures		\$10,000.00
Public Service Announcements (production and distribution)	2 @ 1,500	\$3,000.00
Launch Event		\$10,000.00
Advertising (paid media)		\$10,000.00
Giveaways (pens, key chains, etc.)		\$5,000.00
TOTAL		\$86,000.00

While some states have opted for 511 to become the brand for traveler information, and in fact have chosen to incorporate 511 as part of their web-based URLs, Michigan will be launching the web component prior to the 511 phone component. MIDrive will be the first ‘brand’ launched to the public, and co-branding 511 with the web-based MIDrive.com can be accomplished without using a 511-based URL. It is recommended that MDOT add a section to MIDrive.com, with a prominent link from the main page. The graphic should use the AASHTO-approved 511 logo, and tie the information available from 511 back to MIDrive.com. This would allow some cross-promotion of 511, and link 511 as a way to access MIDrive information by phone.

Recommended Implementation Strategy

Implementing 511 in Michigan will require a phased approach in order to establish key data sources, processes and policies throughout the MDOT regions. Phasing will also be important to be able to build on the efforts of MDOT and MDIT to establish the MIDrive web-based traveler information tool for the Detroit area, and will need to closely coordinate as the MIDrive is expanded to serve as a statewide web traveler information tool. MDOT will also be implementing an ATMS in phases.



A three-year implementation schedule was developed for Michigan's 511 program. This would allow time for development and implementation of key data sources, including the enhanced statewide lane closure database. It will also allow sufficient time for MDOT to procure a contractor to design, implement and operate the system. The recommended phasing and schedule includes a public launch of the statewide MIDrive occurring mid-year 2008, and the public launch of the 511 service in early 2009.

To allow sufficient time for 511 system development, integration and testing, a three-month burn in period ("soft launch") is recommended following system testing. This will allow time to work through any operational issues prior to making the public aware of this service. If the contractor is able to complete system design and testing earlier than noted on this schedule, a launch can occur sooner than Spring 2009. MDOT might want to weigh the impacts of launching 511 during the height of winter driving season, or deferring a public launch to occur prior to the summer construction season.

In looking at the three-year recommended scenario, a breakdown of annual activities, as well as estimated costs, is shown below.

- Year 1 (Calendar 2008) – Includes primarily system design and development, with minimal operations. Telecommunications call routing is included with Year 1 costs. Marketing planning is also included.
- Year 2 (Calendar 2009) – Includes public launch and first year of system operations (although on a pro-rated basis). Year 2 assumes continued enhancements to the MDOT Traveler Information Database for interfaces with various systems, including Lane Closure Database, ATMS, RWIS, and potentially other data types. Ongoing enhancements of the IVR are anticipated to address minor issues. Marketing will continue.
- Year 3 (Calendar 2010) – second full year of operations, assumes 30% growth in call volumes over the basis first operational year (year 2).

Task/Activity	Year 1	Year 2	Year 3
511 Detailed Requirements/RFP	\$25,000		
Telephony/IVR			
New IVR System Design/Development	\$500,000	\$100,000	\$100,000
Existing MDOT Traveler Information Database	\$50,000	\$25,000	\$25,000
System Interfaces and Integration	\$25,000	\$25,000	\$25,000
Telecommunications Call Routing	\$250,000	\$15,000	\$15,000
Operations and Maintenance	\$150,000	\$775,000	\$1,345,500
Marketing	\$30,000	\$90,000	\$25,000
FTE - Statewide ATIS Coordinator	\$75,000	\$75,000	\$75,000
Annual totals	\$1,105,000	\$1,105,000	\$1,610,500
3-year total			\$3,820,500

These costs do not reflect the MDOT costs and staff time for development of the Lane Closure Database enhancements, MIDrive or the ATMS.

Several factors could influence the initial cost estimate:

- Call volumes in excess of the estimated amounts for years 1, 2 and 3
- Reduction in routing charges as a result of negotiating with telecommunications carriers, particularly AT&T and Verizon landline (this cost estimate does not assume monthly recurring charges)



- Ongoing enhancements in Years 2 and 3. Some development has been accounted for in the IVR and Operations and Maintenance because there are anticipated additional systems and technologies that will come on line which will interface with the 511 service.
- Acquisition of private sector traffic flow/speed data on corridors not covered by MDOT sensors.

511 costs and operational requirements are usage driven. To provide a baseline for estimating the potential usage of Michigan's 511, information from other statewide services was obtained from a recent 511 Coalition-sponsored study. Using this information, combined with MDOT's statewide population and the likely impacts of winter weather on 511 call volumes, the following estimates have provided the assumptions for the cost estimate:

Usage Estimates	Year 1 Basis	Year 1 Pro-rated	Year 2	Year 3
# of calls to 511	900,000	675,000	1,170,000	1,521,000
Minutes used	1,602,000	1,201,500	2,082,600	2,707,380

**Minutes were calculated using a 1.78 minute per call average. This average was calculated based on an average of other statewide 511 per call minutes, as reported by the Coalition.*

Resource Requirements

Implementing a 511 service in Michigan will require a long-term commitment to fund, operate, and maintain this traveler information resource. MDOT is already making substantial investments in MDOT-supported traveler information. These kinds of traveler information tools will require an investment of resources – including funding, inter-department coordination, staff, and partnering. The following describes the key resource requirements recommended as part of Michigan's 511 implementation and expansion of its traveler information tools and programs.

- Ongoing coordination with MDIT for continued enhancements to the key supporting systems, including integration of the ATMS, Lane Closure Database, future RWIS and other data sources. Even with a contractor on board to develop and operate the 511 IVR, DIT will serve as a key partner to provide technical expertise and support to provide the platforms for data exchange between MDOT and the private partner.
- MDOT will need to coordinate with and involve contracts and procurement to develop an RFP to hire a contractor/vendor for 511 system design, integration and operations. Furthermore, any future partnering arrangements with private sector (such as for data obtained through private partner infrastructure or systems) will require review and monitoring of agreement language.
- Processes and procedures for MDOT's lane closure database for data entry, monitoring and operations will need to be established and utilized statewide. Consistency of information entered into these systems is paramount to the success of MDOT's traveler information program.
- It is recommended that MDOT identify a statewide Traveler Information Manager/Coordinator to serve as the central contact for 511, MIDrive, contractor coordination, working with private partners, and liaison with other departments for operations and enhancements to the statewide traveler information tools (including the ATMS and Lane Closure Database). Several states have found significant benefit in assigning a central point of contact for traveler information; Virginia, Tennessee, Kansas, and others each have a statewide traveler information position. While 511 is a big part of their job responsibilities, other responsibilities could include managing the partnerships that support the traveler information program, both public and private.



SECTION 1 – INTRODUCTION AND OVERVIEW

This Implementation Plan is part of a series of documents that comprise the Michigan Statewide Strategic Plan for 511. MDOT is spearheaded the development of a feasibility assessment and strategic plan for a 511 traveler information service that would provide travelers in Michigan with road and travel conditions information. There are currently 26 statewide systems and 8 regional/metropolitan systems active throughout the United States.

One of the key tasks of the Strategic Plan was to formulate a Go/No-Go assessment to develop an implementation plan for 511. It was deemed feasible to move forward with developing a recommended implementation strategy, cost estimate, project architecture and implementation schedule. Since the major effort occurred on the Strategic Plan, MDOT and its partner state agency (Department of Information Technology) have initiated development of several key systems that are integral to the overall traveler information program strategy. This Implementation Plan for 511 factors in the development and timing of these systems, including the enhancements to the Lane Closure Database, MDOT's web-based traveler information system (MIDrive, which currently provides information for the Detroit area, but is envisioned to expand statewide), and the ATMS software.

The objective of the Implementation Plan is to provide MDOT with an overview of the key issues and considerations for a 511 traveler information service, important coordination issues between 511 and other systems, a recommended schedule and phasing plan, as well as map out roles, responsibilities, and funding requirements (implementation and O&M). This Implementation Plan includes the following sections:

- **Section 2 – Michigan 511 Key Components and Vision.** This section describes the recommended concept for a statewide 511 service, including the relationship of 511 to web-based traveler information. Available content to support a 511 service for an initial launch, as well as potential future content, is also discussed.
- **Section 3 – Data Sources for Michigan's 511.** Several data sources for Michigan's 511 and web-based traveler information service are presented in this section. These include the enhanced Lane Closure Database, ATMS software, incident and weather data. Another potential data source could include private sector speed and travel time information.
- **Section 4 – 511 Architecture and Configuration.** This section provides a schematic of an initial and future program architecture for a statewide 511 service. The schematics show the flows of information from the data sources to the 511 phone and network interfaces. It also discusses in detail the components that comprise the 511 system, including the supporting servers and databases, the telephony/IVR component, and the routing component.
- **Section 5 – Michigan 511 Business Model Recommendations.** This section provides guiding principles for the business model in Michigan based on the national guidelines developed by the 511 Coalition. A discussion of 'lessons learned' from other states regarding public/private partnerships is also provided. Tables present roles and responsibilities for the various partners in Michigan's 511, including near-term (implementation) as well as potential future partnerships.
- **Section 6 – Telecommunications Routing Issues and Strategy.** This section presents the landline and wireless routing issues for 511, including the roles of telecommunications carriers, importance of coordinating on routing issues, and the differences between landline and wireless networks as they relate to 511 routing. This section also provides a list of landline and wireless carriers in Michigan that would likely need to implement the necessary routing and switching to enable 511 call routing. Cost and cost considerations are also discussed.
- **Section 7 – Marketing Strategies.** Promoting awareness of 511 and web based traveler information is an integral element to successful usage of these services. This section outlines some low-cost,



high impact strategies, including media relations, advertising, and utilizing partners to help promote these services provided by MDOT. Strategies for co-branding the 511 service with the MIDrive web site are also presented. Estimated costs for launching the service, promoting and advertising are included in this section.

- **Section 8 – Implementation Strategy.** The Implementation Strategy provides cost and schedule/phasing information for a 511 service in Michigan. Projected funding needs are identified for a three-year scenario (development, implementation and operations). Also included in this section is an estimate of anticipated usage of a Michigan 511 service, as well as resource requirements for MDOT to consider.



SECTION 2 – MICHIGAN 511 KEY COMPONENTS AND VISION

The overarching vision in Michigan is for a statewide traveler information program that encompasses both phone and web services. The Michigan Department of Transportation recognizes that this will need to be a phased effort, and that there are components that will need to be in place to support these statewide tools. These include statewide data, partnerships, technical resources, and a funding commitment to sustain these services.

There are essentially two implementation approaches that have been considered for the Michigan 511 traveler information service:

- Regional deployment of 511, with a focus on metro areas that have robust data; and
- Statewide deployment of 511, which provides a limited set of information on a statewide level with more detail for areas where it is available.

The recommendation that emerged from the Michigan 511 Strategic Plan was for a centralized statewide service that provides a “basic” level of content on a statewide level, and be capable of providing more detail in the metro areas where information about congestion, incidents, travel times, and other transportation network conditions are available and accessible.

The majority of active 511 states have taken the approach of a centralized, statewide system. This provides several benefits in that these 511 services are linked to statewide reporting systems (lane closures, incidents, etc.), and there is a level of consistency in the data types being fed to the 511 phone and web services on a statewide level.

A key issue with regional versus statewide is in the call routing component. Landline telephone networks have more uniform boundaries, which can correspond to specific counties or regions. Wireless networks (such as those offered by Verizon, Sprint/Nextel, Cingular and others), on the other hand, have a very different coverage approaches compared to the landline networks. Wireless networks do not correlate to geographic boundaries, so there is inherently a risk of overlap among the different network coverage areas.

Two states – California and Florida – have multiple regional 511 services. In the case of California, the San Francisco Bay Area was the first 511 in the state, and evolved from the established 1-800-COMMUTE hotline which was largely focused on transit information. The 511 service in the Bay Area has been spearheaded by the region’s Metropolitan Planning Organization (MPO). Other 511’s in California are following a similar pattern, and now there are active 511’s in the Sacramento and San Diego regions, with 511 planning underway in the Los Angeles area and the Central Coast. There are no immediate plans to implement a statewide service that would serve as an umbrella system over these regional systems, but California is now facing challenges with coverage areas and wireless network overlap such that callers may be getting redirected to other services based on where they are calling from and where that particular tower is programmed to send 511 calls. Florida is facing a similar situation in that there are several active regional systems – Tampa, Southeast Florida (Miami Area) and Central Florida (Orlando). Florida DOT is trying to migrate to a statewide system and has faced some challenges with call routing.

There are other issues that come in to play with multiple regional systems. First, it requires significant duplicate (or triplicate) effort in terms of developing and maintaining multiple systems versus a single statewide system. With the comes the issue of consistency of information from one system to the next – each system may have a different menu structure, navigation or level of detail, which provides the user with having to adapt to different systems throughout the state. To effectively leverage MDOT (and other partners) investments in traveler information, it was agreed that a statewide system would be the goal of



the 511 program in Michigan. This will provide users with a ‘one-stop’ resource for statewide information, serve as a central point of reference for media and other partners, foster awareness among Michigan travelers of the DOTs role in providing these tools, and best leverage MDOT’s resources for development and operations.

2.1 MDOT Web Traveler Information

Web-based traveler information has become an integral part of many states’ 511 services. Since the development of the 511 Strategic Plan, MDOT has embarked on in-house activities to develop and operate a web-based traveler information tool. Previously, MetroCommute was under contract to operate a Web site that provided Detroit area traffic and incident information. The MetroCommute contract was set to expire, and MDOT received approval from management to extend that contract while MDOT developed an in-house version. MDOT did a soft launch of the MIDrive web site in May 2007. MIDrive provides Detroit metro area freeway traffic conditions, color-coded speed map, a table of average speeds for each freeway corridor, closed-circuit television (CCTV) snapshots and a scrolling text box to warn of any alerts or major incidents. A screen shot of the current MIDrive site is shown in **Figure 1**. Construction activity or restrictions are not yet integrated into the MIDrive real-time traffic map, but a list of planned construction and lane closures is available via the site.

MDOT is working on a phased roll-out of several enhancements. Getting the MIDrive site in place was the first piece, and MDOT is now working on enhancing the map interface capability, and is working closely with the GIS group to get the map display in place. The second major phase will include an enhancement to MDOT’s lane closure database, which is currently not in a mappable format, and therefore cannot link to the map display on MIDrive. In addition to establishing this interface between the lane closures and display, MDOT is implementing several other user process enhancements to the database and standardizing data fields and formats so that it will provide a robust foundation for MDOT’s traveler information applications.

The MIDrive site was not co-branded with 511; the 511 phone component is not in place, and MDOT opted to move forward with the web phase of its traveler information program while the 511 phase was still in the planning stages. Later sections of this Implementation Plan discuss strategies for co-branding the MIDrive Web and 511 phone traveler information systems.

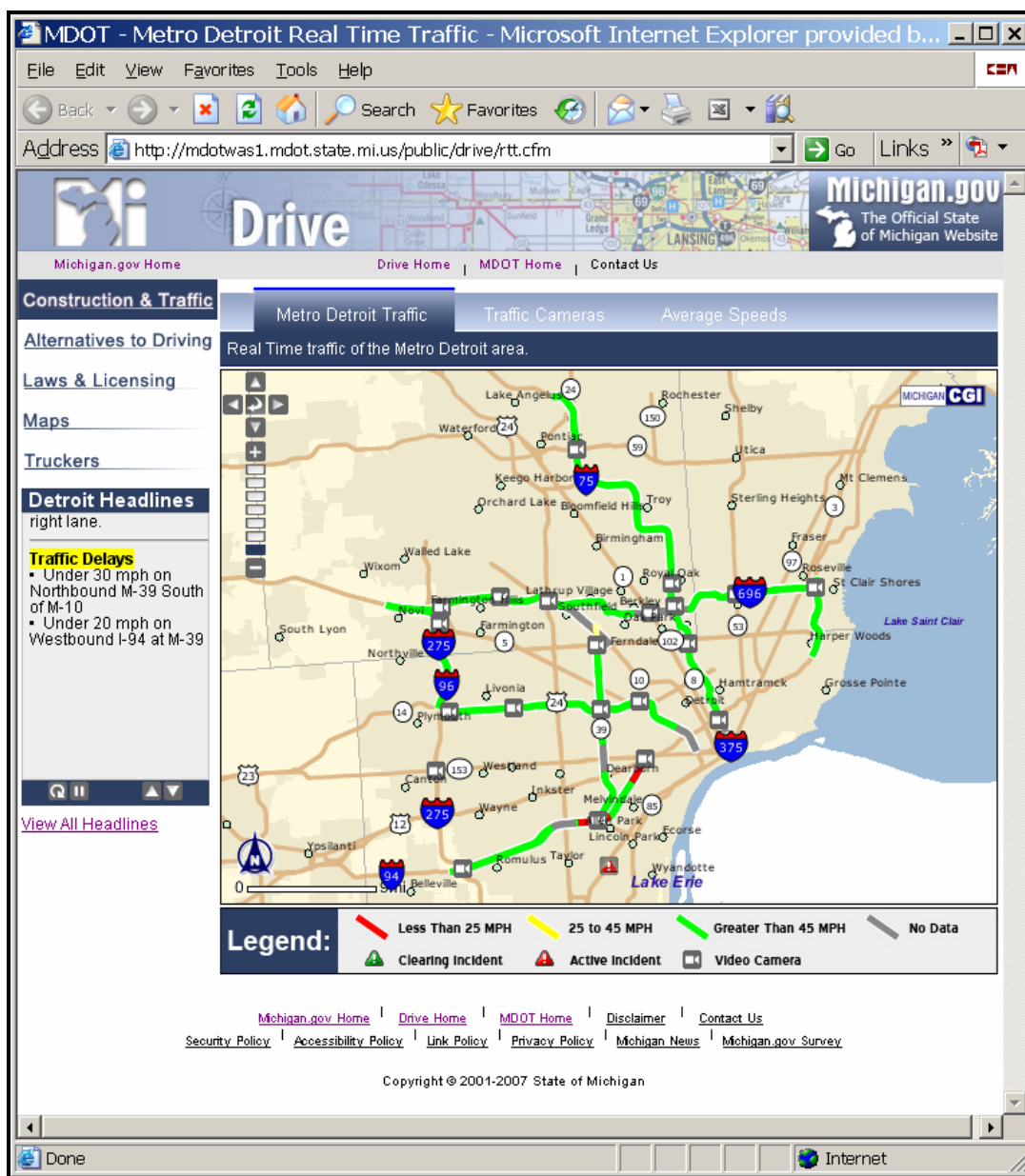


Figure 1 – MIDrive Screen Shot

2.2 Content for Michigan's 511 Traveler Information Services

The Implementation and Operational Guidelines for 511 Services (version 3.0, September 2005) recommends the following 'basic' content for a 511 telephone service:

- Roadway (emphasis on the National Highway System roadways);
- Public Transportation/Transit; and
- Weather that impacts travel.

2.2.1 Initial Content

Minimum Roadway content for 511:



Roadway information, including planned construction, closures, incidents and any lane restrictions due to construction or incidents.

- Roadway information should cover all National Highway System roadways in Michigan (Interstates, US routes and state routes/highways).
- Construction/restrictions – provide road segment, impact (such as closure, lanes restricted, etc.), and end date. Additional information can also be provided, such as “expect delays”, or “use alternate route”, depending on the severity of the impact. Include mile marker or exit. Provide additional geographical context as appropriate (interchange, city, county).
- Additional detail shall be provided for instrumented metro areas, including Detroit metro and Grand Rapids (when available)

Public Transportation Information:

There are several statewide 511 services that do not have public transportation information integrated with the phone service. Those that do provide public transportation information will typically have a menu option, and then provide callers with a list of available public transportation agencies to which they can request to be transferred. Calls are transferred to existing transit customer service call centers and dropped from the 511 service. At present, there is not a centralized transit information resource for the State of Michigan. MDOT could identify transit providers in the larger metro areas to provide callers with a transfer; however, if these transit centers do not have a toll-free number to accept calls, MDOT will incur long-distance fees to transfer the caller. Until such a time that transit can provide additional info to 511, it is not recommended that an initial 511 service include an option for transit information.

Roadway Weather Content:

Information about weather conditions that could impact travel should be made available to callers. Michigan’s 511 service should provide information about snow, ice, forecasted inclement weather, or hazardous pavement conditions as a result of weather or weather events. Weather impacts should be provided with a navigation reference to include corridor and location (city, county, or multiple counties).

Emergency Alerts:

MDOT’s 511 should also include capability for emergency floodgate messages and alerts as part of the initial rollout. Floodgates are uninterruptible messages at the beginning of the 511 menu that will provide a recorded message to all callers.

These should be limited to:

- AMBER Alerts;
- Major closures or disasters impacting a substantial segment of roadway; and
- Evacuations due to fire, weather or other emergency.

2.2.2 Potential Future Content

- Integrated RWIS data for key corridors
- Integrated forecasted road conditions for key corridors
- Transit information statewide (via call transfers)



- Tourism and traveler services information, statewide (via call transfer to Travel Michigan toll-free number)
- Commercial vehicle information
- Corridor travel times
- Special event traffic impacts and information
- Transfers to Neighboring states' 511 services and Ontario 511

At present, there are no states adjacent to Michigan with an active 511 service. Wisconsin is in the process of selecting a vendor to design, implement and host a statewide 511 service. Illinois DOT issued an RFP for a 511 provider, but has elected to put the project on hold. Indiana is in the planning stages, and a statewide system for Ohio is not yet underway. It is recommended that MDOT transfer callers to neighboring state 511 systems when they come on line, and under a mutual call transfer agreement with those 511 states. Canada was approved for the 511 abbreviated dialing code in July 2006, but to date 511 is not deployed.

SECTION 3 – DATA SOURCES FOR MICHIGAN’S 511

At present, Michigan has limited centralized information to support a 511 phone or web service, although there are projects underway that will develop enhanced regional data collection tools as well as establish statewide road closure information in a format that can be effectively utilized by a traveler information service. Based on available data, elements for an initial statewide 511 service are shown in Table 1.

Table 1 – Information to Support an Initial Statewide 511 Phone Service in Michigan

Information Type	Source and Status
Planned closures, construction activities and lane restrictions (statewide)	MDOT lane closure database. MDOT is currently developing an enhanced version of its statewide database; expected launch early 2008.
Metro area traffic conditions and congestion (Metro and Grand Regions)	MTS Center data for Metro region. Existing software and system can provide metro area road/traffic conditions and incidents. A new ATMS system is planned, and Grand will be part of a Phase 1 roll-out; expected launch mid 2008.
Incidents on state highways	Michigan State Police and local law enforcement. Incident information outside of the Metro Region is not captured through an automated interface. Would require MDOT staff to enter incidents into lane closure database.
Weather	Michigan State Police winter weather advisory. Currently not automated, would require MDOT staff to enter into lane closure database. Forecasted conditions can be obtained from NOAA/National Weather Service and included with corridor reports.

This section discusses the status of these data sources to support a 511 service, as well as activities underway by MDOT to develop standardized data tools and resources.

3.1 Lane Closure Database

The foundation for a statewide service that provides road and travel conditions information is a road/lane closure and restriction reporting system. Michigan DOT currently operates a lane closure database for all Interstate highways, US routes and state highways. Local information can also be included, but must be reported by local agencies to an MDOT region for entry into the database. This is an internal admin application available via the MDOT intranet. Traffic and maintenance staff in each MDOT region can enter information in for affected roadway segments. The current lane closure database is used for planned construction and maintenance activities, and does not currently include incident information. **Figure 2** shows how information is currently displayed via the web interface for the lane closure database. Information fields provide the following:

- Highway Name (category);
- Nature of impact (i.e., total closure, lane closure, shoulder work, lane shift, ramp closure, etc.);
- Start Date – End Date;
- Geographic reference (segment, mile marker, exit) and direction;
- Additional detail information (free form text);
- Detour information;



- Restriction information; and
- County.

The screenshot shows the Michigan.gov Drive website. The browser address bar displays the URL: <http://mdotwas1.mdot.state.mi.us/public/LaneClosure/index.cfm?ShowAll=28&Region=7>. The website header includes the Michigan.gov logo and navigation links: Drive Home, MDOT Home, and Contact Us. A sidebar on the left lists links for Construction & Traffic, Alternatives to Driving, Laws & Licensing, Maps, and Truckers. The main content area is titled "Choose Any Combination" and features a map of Michigan with a blue square indicating the Bay Region. Below the map are dropdown menus for Region (Bay), Counties (All Bay Counties), and Routes with closures (All Bay Routes). There are also input fields for Start Date (06/15/2007) and End Date (06/15/2007), along with Submit and Reset buttons. A link for "About Alternate Routes" is also present. The section "Bay Region Closures" is displayed, with links for "Show All Details" and "Hide All Details", and a "Printer Friendly" option. The closures listed are for Interstates 475, 69, and 75. For I-475, a single lane closure is noted from Mon 10/23/06 to Sat 11/17/07. For I-69, multiple closures are listed, including micro-surfacing, single lane closures, and a ramp closure. For I-75, a single lane closure is noted from Fri 6/1/07 to Wed 9/19/07. The status "Expires in 96 days. Last updated: 1/30/07 10:50 AM" is shown at the bottom of the list.

Figure 2 – Current MDOT Lane Closure Database Outputs (Web)

Challenge: At present, the majority of information entered is free-form, which is not consistent region-to-region. Free form text descriptions are valuable for internal operations and management, but will not translate well into an automated road conditions reporting format through a 511 IVR. Standardizing data entry fields will help to promote consistency of information on a statewide basis. MDOT could use the current lane closure database if 511 was to be implemented within the next several months. Filters would need to be applied to allow only pertinent or high impact events to be sent to the 511 service. This way, callers will only be provided with lane closure information that could impact travel, and would not be provided with every event in the database, many of which may have no impact on travel at all (i.e., shoulder work, landscaping, etc.) MDOT would need to establish a threshold for event types to be sent to the 511 service.



Michigan's Department of Information Technology is developing, in-house, an enhanced lane closure database that will establish standard data entry fields as well as interface with a geo-coded map, thus providing a robust data engine for both phone and web traveler information services. 511 will require a streamlined set of data that can be succinctly presented to callers; the web allows for more detail. With the lane closure database serving as the foundation for the statewide 511 service, it will be important for MDOT to implement consistent processes in each region for information entry and monitoring the database to ensure that information is not out of date or inaccurate.

3.2 Metro Area Road and Travel Conditions Information

At present, Detroit and Grand Rapids are the only areas with MDOT freeway management instrumentation, which provides real-time information on freeway traffic and congestion volumes, CCTV coverage and dynamic message signs (DMS) for traveler information. MDOT's MITS Center manages approximately 200 miles of urban freeway in the Detroit metropolitan area. Data available to support traveler information applications includes approximately 180 CCTV and 2,200+ loop detectors and supporting communications infrastructure. An expansion project on I-96 and I-94 in the Detroit area will provide approximately 18 new CCTV. MDOT also obtains data on certain corridors from Traffic.com's ITIP sensors.

In the Grand Region, the West Michigan Traffic Management Center (TMC) monitors and manages 17 CCTV; a near-term project will add approximately 50 detectors on US-131, I-196 and I-96. The West Michigan TMC also provides traveler information via 10 DMS.

MDOT is currently developing requirements for an ATMS software system that will replace the current freeway/ITS management system in the MITS Center, as well as serve as an operating system for statewide ITS components. Although the project is ultimately looking at a statewide concept, the initial roll-out will focus on regional ATMS management and control. It is envisioned that the ATMS will provide for control of ITS devices (CCTV, DMS), integrate freeway detector data to generate speed and travel time, integrate incident data, and real-time road weather conditions from RWIS sensors. Requirements for the ATMS have been developed with input from statewide stakeholders, and MDOT expects to issue a Request for Proposal in July 2007 to select a vendor to provide the software. The focus of the initial implementation will be on the Grand Region.

The relationship of the ATMS to MDOT's 511 effort is critical. While there is a significant emphasis of the ATMS on management and control functions and enhancing MDOT's current reporting capabilities, the ATMS can also serve as a centralized source for key data to support a statewide traveler information service by providing integrated lane closure and restriction information, incident data, corridor travel conditions, and weather information. The requirements also specify that the ATMS also be capable of supporting transportation-related special event information, emergency warnings and alerts (AMBER Alerts, weather, evacuations, etc.).

Implementation of the ATMS on a statewide level is not anticipated within the next two to three years. A phased approach is being taken which will initially implement the ATMS in the Grand Region (Phase 1). Stakeholders throughout the state emphasized the need for having a centralized tool that would eliminate data entry in multiple locations, minimize erroneous reporting or information gaps, as well as be capable of supporting a traveler information system that could provide vital information to the traveling public about current road and travel conditions.

3.3 Incident Data

Information about incidents on highways throughout Michigan can originate from a variety of sources. In the metropolitan areas, the Michigan State Police have primary jurisdiction over incidents occurring on freeways. Outside of the metro areas, however, sheriff or local police may be the first law enforcement agency dispatched. As a result, there is not a centralized statewide location for incident data. A CAD interface between the lane closure database or ATMS could provide for automated incident exchange to include MSP incident data into MDOT's reporting systems. Operators at the MITS Center have access to a CAD screen and can view incidents for that Region and enter into their current program; this incident information is then incorporated into the current web traveler information tool (MIDrive), but is limited to the Detroit area. 511 and similar traveler information services are often the impetus for increased coordination between DOT and law enforcement, particularly to be able to capture pertinent incident data to include on these publicly accessible systems. Many states have seen increased emphasis on better information exchanges between state police and state DOT; this coordination is often spearheaded by DOT staff – they want the information that their agency is putting out to the public to be as comprehensive and accurate as possible.

The ATMS will include incident data entered by operators at the regional centers, but statewide deployment of the ATMS will be phased. MDOT needs to look at processes that can be put in place for MDOT staff in the MDOT Transportation Service Centers (TSCs) throughout the state to be able to enter pertinent incident information into the lane closure database for inclusion with the statewide 511 service.

3.4 Weather

To expand the amount of information available about road weather conditions on Michigan's Upper Peninsula, MDOT is evaluating deployment of a number of additional RWIS sites throughout the state. Current weather data in the region comes from 13 weather sites operated by the Department of Natural Resources and 12 sites operated by the National Weather Service. A recent feasibility study completed by MDOT identified locations for deployment of 32 additional RWIS sites throughout the Superior Region. These 32 sites would be deployed over time, with five separate phases identified as part of the study. Deployment sites include major state highways and key bridges throughout the Upper Peninsula, including the International Bridge between Sault Ste. Marie, MI and Canada, and the Mackinac Bridge between Michigan's Upper and Lower Peninsulas. MDOT is embarking on an RWIS Concept of Operations for the North and Grand Regions, which will identify additional potential RWIS locations throughout those regions.

The RWIS sites would include typical weather sensors for gathering road conditions information, including pavement conditions, air temperature, visibility, wind speed, and other conditions. The RWIS control center will be located at the MDOT Lansing office. The RWIS sites are expected to be tied to a server located in Lansing operated and maintained by the Michigan Department of Information Technology. As the proposed RWIS system is deployed, some of this data could be incorporated into the 511 telephone system database and used to supplement available road conditions information for the Superior Region.

RWIS can provide MDOT with valuable real-time information about pavement, atmospheric and precipitation conditions on key corridors and bridges. To supplement RWIS information, forecasted weather conditions and actual weather advisories are available via the National Weather Service or similar weather providers. These can be included with phone and web based traveler information tools, although MDOT will need to assess the value of 'typical' forecasted

conditions for the 511 phone component. Many states have opted to include weather information by phone only when weather conditions (or predicted conditions) pose an impact to travel.

3.5 External Data Sources

Although MDOT will serve as the primary data source for its statewide traveler information services, information from other partners – either a direct data transfer or a call transfer/web link – are also envisioned to be a part of the initial and future phases. These key partners include state and local public agencies.

MDOT does have additional potential partners to consider. Data collection was once thought to be a public-sector responsibility – it was the public sector that deployed freeway sensors in the urban areas to monitor speed, flow and congestion levels, and in turn implement traffic management strategies based on current traffic conditions. Detectors, as a primary strategy, have their limits. They are costly to deploy and maintain, and the communications infrastructure to support detectors makes it infeasible to deploy on corridors outside of metropolitan areas. Limitations on the feasibility of broad geographic coverage of public-sector sensor data are leading both the public and private sectors toward non-infrastructure-based probe data collection. Two options have emerged in the private sector marketplace that could provide MDOT with additional data on corridors not currently instrumented with detection:

- Cell-phone based probe data; and
- Aggregated data, with an emphasis on GPS-equipped fleet probe data.

This section discusses both of these options. They both provide a broader geographic coverage of traffic conditions information than is feasible with traditional infrastructure-based detection systems. It is important to note that probe data (which both options rely heavily on) would provide MDOT with speed and/or travel time, but not does provide volume or occupancy data. Speed and travel time translate well to traveler information systems; from an operations perspective, it may not provide enough detail.

3.5.1 Cell Phone Probe Data

Recent years have seen a significant focus on how to use cell phone tracking information to determine corridor travel conditions. The concept relies on a vast network of cell phone users navigating a corridor that provide location data as their phone locations are picked up by cell phone towers. Companies such as AirSage, Delcan and Cellint have been aggressively pursuing this model, which requires partnerships with wireless communications providers to be able to obtain data about cell phone locations. By applying an algorithm to calculate speed between point A and point B (and so on throughout a corridor), the premise is that speeds and travel times can be calculated based on the location and signal information received from a wireless phone moving through a network of towers.

Early applications of this model did not fare well – in fact, a study from the Hampton Roads, Virginia area in 2006 showed the cell phone data degrading significantly during heavy congestion or incident conditions (cell phone probe data was compared to VDOT loop data in a ground truth analysis). A comprehensive study, *Travel Time Estimation Using Cell Phones (TTECP) for Highways and Roadways*, which conducted and completed in 2007 by Florida International University, reviewed and summarized the latest world-wide 10 projects involving travel speed and travel time estimations based upon the cell phones as travel probes. The study report concluded that the accuracy of the cellular based traffic information depended heavily on the level of traffic conditions of the road. In comparison

with the physical sensors and GPS, cellular based technologies obtained good results in free-flow conditions, but there was conclusive evidence that the technologies are mature enough to provide accurate data in heavy congested traffic conditions. Furthermore, it was also found that highway applications are more favorable than the arterials. This shows promise that this model is improving, and could provide state DOTs with a viable option for speed and travel conditions information on corridors beyond urban areas.

Georgia DOT completed another recent evaluation of a cell phone probe data pilot program (Cellint), where the probe data matched the physical sensor data very closely (less than 5% average difference) both during congested and free-flow conditions. A similar outcome was seen in Kansas City, although the analysis was not conducted during congested conditions.

While there have been some very encouraging strides with this model, there are also a few challenges that MDOT should consider. First, obtaining this data requires several layers of partnerships – successful probe data collection means that wireless phone companies must be on board to provide the signal location data of their customers. One cell phone company may not be enough, so it will be important for the private sector vendor to successfully negotiate with national wireless carriers to be able to obtain a good cross-section of data. Second, private sector data comes at a price and usually with contractual stipulations on how their customers can use the data. Private sector needs to be able to monetize their commodity, and the public sector is one of several potential consumers; these companies also market to other private sector entities. In other words, if MDOT enters into an agreement to purchase private sector data, the department will not likely have exclusive rights to that data. Any contractual reviews or discussions will need to carefully weigh the terms of use. An additional challenge is wireless coverage areas. This model is very dependent on adequate cell phone coverage; in areas where coverage is minimal to non-existent, it will not generate any tracking data.

It is recommended that MDOT monitor the progress of this model with other state DOT's in making a determination about the feasibility of cell phone probe data for Michigan. Wisconsin DOT recently signed an agreement with AirSage to obtain travel time/monitoring/speed information on selected corridors. This is a two-year, \$600,000 contract. Outcomes from this project could provide valuable insights into the value of the information WisDOT receives, accuracy of information along rural and inter-regional corridors, as well as sustainability of the partnership (between the private contractor, cell phone companies and others).

3.5.2 Aggregated Data, including Fleet GPS Probes

Another private sector data option is that of fleet GPS data. Inrix was among the leaders to capitalize on the prevalence of global positioning satellite (GPS) tracking technologies in commercial vehicle fleets. (Traffic.com has since followed suit, and TrafficCast also aggregates fleet probe, cell phone, DOT detector and historical data to provide information on key corridors. These companies aggregate data from several sources (including DOT detector data, planned closures and available incident information) to provide corridor travel time data. GPS data is obtained from commercial fleets equipped with tracking equipment; these sources are proprietary. Similar to the cell phone probe model, aggregated data that relies heavily on GPS fleet probe data is dependent on a sufficient number of probes traveling corridors, and quality of the data is highly dependent on the number and types of fleets represented.

Some of the challenges with this model are inherent when one looks at the dynamics of fleet data. First, commercial vehicle drivers will avoid congested corridors if they can, and will



tend to avoid peak travel periods if at all possible. They do, however, provide a key source for intra- and interstate corridor data. Other types of commercial fleet vehicles, such as delivery or taxi/shuttles may have a limited area of coverage, which would not provide any data beyond urban areas. Inrix, Traffic.com and TrafficCast are continuously improving their models and approaches to move beyond traditional infrastructure-based data collection strategies.

Inrix recently signed an agreement with the Wisconsin DOT to provide traffic flow data for 250 miles of US 41 and I-43 (between Milwaukee and Green Bay). Michigan DOT should monitor the outcomes of this pilot, and work with WisDOT to compare the Inrix study to the AirSage corridor traffic flow data (discussed above, also in Wisconsin).

3.5.3 Considerations when using Private Sector Data

Michigan DOT already has a partnership with Traffic.com which provides MDOT with sensor data from Traffic.com's TrafficPulse sensors on corridors in the Metro region. MDOT can use this data for its internal traffic management purposes, but is restricted from certain uses of that data (such as posting travel times received from Traffic.com on the MDOT web site or DMS).

Many private sector contractual arrangements are likely to have similar terms; they need to be sure to safeguard the value of their data in order to continue to market it to other customers. These companies have traditionally partnered with other private sector entities – providing traffic flow and speed information to support media traffic reports, web-based tools, in-vehicle navigation and traveler information systems, portable wireless services, etc. Recent years have seen increased focus from the private sector on tapping in to the potential of the public sector as a customer for their data. It will be MDOT's responsibility, if they enter into an agreement for private sector data, to be sure that data does not enter the MDOT data feed which is then in turn provided to a number of outside entities at no cost.

SECTION 4 – 511 ARCHITECTURE AND CONFIGURATION

4.1 Initial Michigan 511 Phone Service Configuration

The Statewide 511 Strategic Plan recommended that Michigan's 511 service be comprised of a **contracted (hosted) network based telephony system**, and use a **hybrid centralized/distributed configuration**. This recommendation was developed based on:

- Technical resources needed to develop the 511 IVR and interfaces to MDOT's data;
- Scalability of the contractor's network capacity to effectively respond to spikes in usage (largely due to winter weather);
- Ability to integrate new data sources as they become available; and
- Ability to leverage funding across implementation, operations and maintenance. By using a contracted option, MDOT will not have to allocate as much funding up-front for capital investment before the 511 service is operational and, as would be the case if a premise-based (in-house) solution was selected.

The proposed architecture and configuration for MDOT's 511 phone service consists of components that will be developed and maintained by a contractor as well as by MDOT. **Figure 3** shows a prototype for an initial implementation of a 511 phone service in Michigan. This initial implementation assumes the lane closure database and initial phase of the ATMS would be part of the first roll-out of a 511 service.

There are three key 'bundles' of required activity to deliver and operate the 511 service:

Call Routing	Telephony Interface (IVR)	Traveler Information Data Sources
Proper routing enables callers dialing 511 from a landline or wireless phone to be directed to the 511 service. 511 is mapped to a toll-free number, which is then directed to a IVR which then 'answers' the call and initiates the 511 information transaction set. MDOT will need to take responsibility for initiating the call routing with landline and wireless providers, and securing a toll-free number to which the carriers can route 511 calls in Michigan.	The IVR manages the caller's request and initiates data transfers to provide the caller with the requested information. The IVR may also transfer the call to an external entity (such as transit or to a neighboring state 511 service), if the IVR has been programmed to do so. The IVR helps the user navigate through menus on the 511 system, and should be structured to allow for multiple requests within a user session. The IVR will 'poll' MDOT's data sources to retrieve the requested information, and then provide it to the user in a succinct manner. The contractor will be responsible for developing the scripts, speech engine and interfaces to enable the IVR functionality, as well as monitor the system for accuracy in user navigation and system polling.	This refers to the collective set of information made available by MDOT for its 511 service. In the recommended architecture initial architecture it is assumed that MDOT has centralized a significant portion of this component by integrating the Statewide Lane Closure Database, ATMS and RWIS data. Additional external data sources, such as forecasted weather conditions from the National Weather Service, can also be included.

Call routing is discussed in detail in later sections of this implementation plan. This section will focus on the interfaces and recommended architecture of the telephony system, and existing and future data sources.

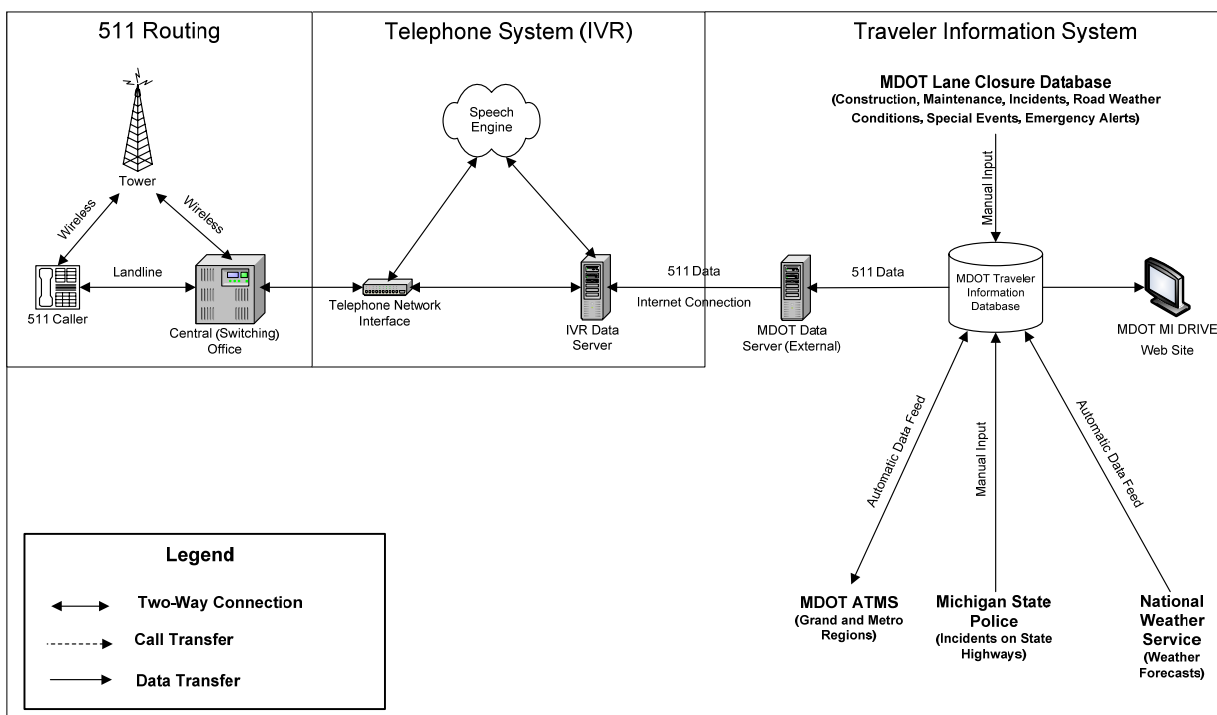


Figure 3 – Initial MDOT 511 Architecture and Interfaces

4.2 Components of the IVR and Speech Engine

4.2.1 Phone Network Interface for Michigan's 511

The telephone network interface should connect incoming calls to the speech engine component of the IVR platform through a group of phone lines, or ports, on the Public Switched Telephone Network (PSTN) that are purchased or leased from a telecommunications provider by the voice-hosting services network provider. These phone lines should be assigned to the 511 routing number established for Michigan. One of the key advantages of using a contracted arrangement for 511 hosting is the scalability factor of the system. Typically, when entering into contracted arrangements, the State and the contractor will need to agree on either a dedicated number of ports or number of minutes. The benefit to MDOT of using a contracted host is the ability to borrow ports (or lines) in times of unusually high call volumes. These contractors maintain call centers with several thousand incoming lines; when circumstances cause a significant spike in calls to MDOT's 511, additional ports or lines can be borrowed to be able to effectively handle the call volume. This temporary borrowing of additional ports includes an additional charge for the extra ports (and perhaps minutes), but the benefit is that if there is a wide-scale incident that prompts several hundred simultaneous calls, callers will not receive a busy signal when needing to access 511.



4.2.2 Telephony Interface/IVR

A contracted arrangement will provide MDOT with external resources to develop the key systems and interfaces to support its 511 phone service. Although the landscape of private contractors that support 511 has changed somewhat over the last several years, there are several who are actively engaged in the 511 business arena. These companies have developed similar IVR systems for traveler information as well as other applications that require an automated menu structure.

In this kind of contract arrangement, the contractor will have several key responsibilities:

- Develop the IVR speech engine data server that will match the caller's requests with the appropriate data to fulfill that request. This will include establishing menus, menu levels and call flow dialogs that prompt callers for the specific information they are requesting. The contractor will develop 'scripts' using concatenated speech, which provides a life-like voice (as opposed to previous technologies that relied on text-to-speech, which made the user feel like they were talking to a machine).
- Configure the IVR to facilitate call transfers to external entities upon request.
- Enable floodgate messages or alerts to be inserted at either the top of the main menu or at the beginning of the submenus. Floodgates at the top of the main menu can be used for major emergencies impacting a wide area (such as an evacuation or a severe storm) or for an AMBER Alert. Similarly, floodgates can also be used within the sub-menus, such as special event announcements. These are typically .wav files that are recorded over the phone (using a secure phone number and PIN) by MDOT staff.
- Develop interfaces to MDOT's traveler information data sources. To ensure security of MDOT's data, **it is not recommended that the contractor have a direct link to any of MDOT's databases.** A preferred option would be to provide the information for 511 on a data server outside of the MDOT firewall, or some contractors may be able to utilize data from an FTP site. Due to the complex nature of the data, an external server configuration is recommended. The external data server will poll the MDOT traveler information centralized server on a pre-set schedule (every two minutes, five minutes, etc.), and will make that information available to the IVR requests. This way, the data formats remain intact, thus minimizing the risk of error when trying to match up IVR requests with data fields.
- Information in XML format obtained from the MDOT data server (external) should be converted by the IVR data server and speech engine to voice messages by combining concatenated voice clips using VoiceXML technology. Information in some other format, such as a pre-recorded message for special event information, should be processed appropriately by the IVR data server so that the desired message is available to 511 callers.

4.2.3 Speech Engine

The speech engine for Michigan's 511 should be capable of recognizing a variety of accents and dialects. It should also allow callers to use "shortcut" commands or request help at any time. For example, many 511 services provide an initial "menu" of available information (such as roads, transit, weather, etc.), and callers can interrupt at any time with their request and be directed to the appropriate information category. A touch-tone, or dual tone multi-frequency (DTMF), interface should also be provided that would serve as a back-up for cases when the IVR does not recognize a voice command or when callers prefer to use touch-tone instead of voice commands. Several systems have implemented this feature. This



an automatic fall-back option if the IVR does not recognize the request after two or three attempts, or it can be announced as an available feature early on in the menu.

Voice messages used to present callers with the requested information should primarily be composed using the concatenated speech capabilities of the speech engine. These concatenated scripts will be developed (recorded) by the contractor, but MDOT should retain ownership of the scripts in case there is a change in who provides the 511 service to Michigan in the future. There will likely be anywhere from 4,000-6,000 individually recorded voice clips for Michigan's 511 service, including highway and road names, cities, directional information, landmarks, date and time information and others. Some clips will be complete words, while others will be sound bytes. Concatenated speech technology then allows these individual clips to be strung together into sentences to respond to callers' requests. Current speech technology provides for very life-like responses from the concatenated speech – callers feel like they are getting information from a real person as opposed to a computerized voice.

4.2.4 Centralized Database

To provide a centralized component that will serve both the 511 phone and MIDrive web site, it is recommended that MDOT establish a centralized database that can be a repository for data to support its statewide traveler information program. This database will initially consist of the MDOT lane closure database information. As the ATMS is implemented in phases, or as additional interfaces are established (such as to obtain private sector data, MSP CAD interface or RWIS feeds), this database will need to expand. Key to this centralized component will be to specify what data types and data formats are needed for the web and phone traveler information system. For example, not all the fields in the lane closure database will be needed to send to the traveler information tools; filtering this data beforehand will provide a more streamlined information feed to the web and phone systems.

4.3 Future 511 Phone Architecture Prototype

Future enhancements for MDOT's 511 will likely focus on automating many of the data inputs to the centralized database. These could include automated feeds from MSP, private sector, RWIS and local agencies. Additional information could be accessible to callers via a call transfers, such as to neighboring states' 511 services when they become available, transit agencies, traveler services and tourism, or other external entities. A conceptual architecture for a potential 511 service is shown in **Figure 4**. This 511 is still built upon the contractor hosted model.

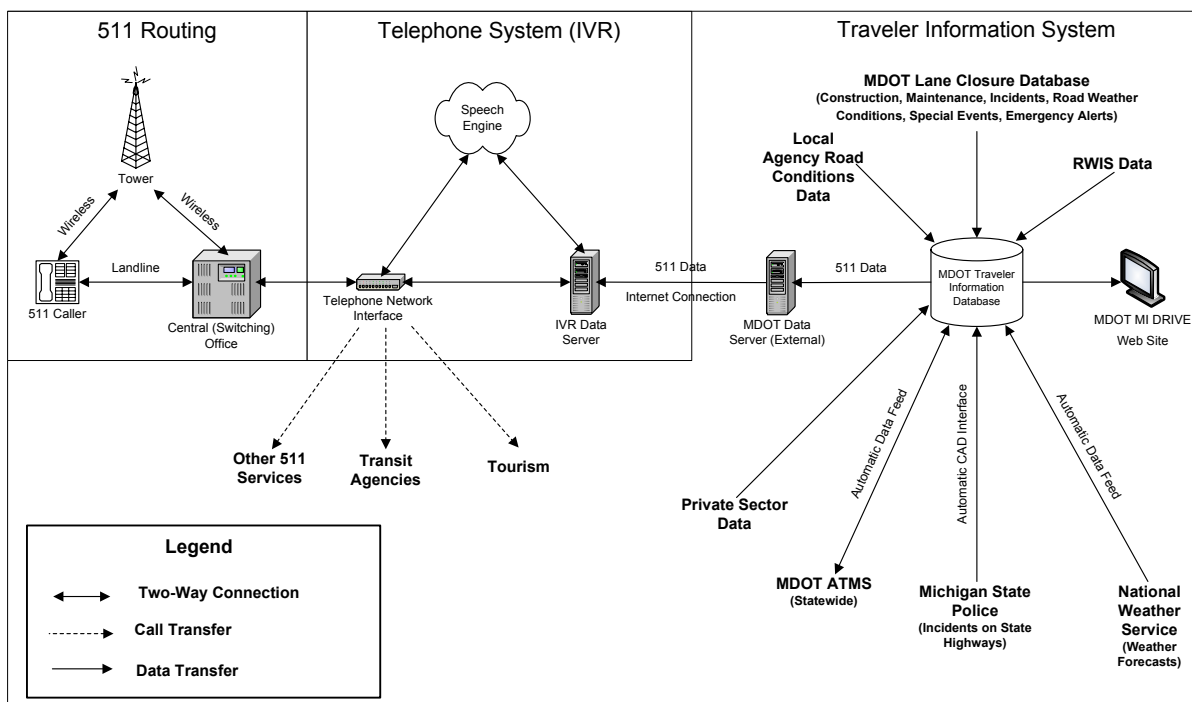


Figure 4 – Future Concept for Michigan's 511

SECTION 5 – MICHIGAN 511 BUSINESS MODEL RECOMMENDATIONS

5.1 Michigan 511 Business Model Guiding Principles

To date, every statewide 511 service has been implemented, funded and operated with significant leadership and resources from the public sector. Business models for 511 range from fully-operated by the public sector to contracted operations (with public sector funding). The National 511 Coalition has established some parameters for the 511 business environment, which, in large part, has an impact on the overall business model and business model approaches:

- Access to ‘basic’ 511 information should be no more than the cost of a local call (airtime minutes for wireless calls will apply per the caller’s plan);
- Deploying agencies should expect to cover the cost of developing and operating the 511 system, excluding any premium content that may be offered (for a fee) by an external entity; and
- Advertising and sponsorship are acceptable, so long as they do not interfere with the user’s primary intent of accessing the service. It is important to note that the deploying agency may have policies that could limit any advertising or sponsorship.

There is not currently a public-sector operated statewide or regional system that has successfully used fee-generating strategies to support the costs for implementation or operations. Traveler information in the broadest sense, and 511 in particular, have not demonstrated a strong market potential for per-use, fee-based services. There are two approaches to this potential model:

1. Provide basic information to the caller (road and travel conditions, transit and road weather impacts), but charge a fee for enhanced content, such as parking reservations, interactive trip planning, or other concierge services.
2. Allow advertising or sponsorship by the private sector as a means of generating revenue to off-set operational costs.

Neither of these options have proven successful in the 511 market. In option 1, the only state to have attempted this model was Arizona. As part of the federally-funded 511 Model Deployment, Arizona issued an RFP for a private partner to provide enhanced content on its 511 service. Arizona received only one proposal, and the company went of business before a contract was negotiated.

For option 2, Virginia is the only state to have developed an innovative model that relied on the public sector for road and incident data, and had a private partner that was responsible for generating revenue through advertising on the traveler services component of the 511 phone and web systems. Virginia went through three iterations of this model, beginning with the Travel Shenandoah program, which then became the I-81 511 system, and was eventually expanded statewide. VDOT and the Virginia State Police provided the data (road conditions and incidents), and the business model focus for the private partner was on a traveler services component. The private partner was responsible for coordinating with hotels, restaurants, attractions, and traveler services that would be willing to pay to have their establishment featured on the Web site and be accessible from the phone service. Ideally these advertisers would also help to promote the 511 service to tourists by displaying flyers, rack cards, and other promotional materials at their businesses. The public sector would support some pieces of the operation, but ultimately there was an expectation that the private sector would generate enough revenue through Web space/advertisement sales to offset the public sector investment. Ultimately, VDOT decided to

phase out the traveler services component as it was not generating enough revenue to offset the public sector costs for operations.

Over the last decade, there have been varying levels of success with the private sector subscription model. Many early business models from the private sector were founded on the premise that customers would be willing to pay a fee for high-quality, accurate, easily accessible, and personalized information. Many of these ventures were not successful. A recent surge in in-vehicle navigation systems – particularly after-market devices – coupled with enhanced mapping, more access to various data sources, reduced costs in wireless communications and proliferation of portable wireless devices, is translating into renewed interest by the private sector in the subscription model. However, this requires a ‘supply chain’ of partnerships to be able to deliver, and there is not a substantial amount of historical information to point to a long-term, sustaining model.

One very innovative approach to supplementing DOT operations funding for traveler information is the Oregon DOT’s partnership with the Oregon Traveler Information Council (TIC). ODOT partnered with the TIC, a “self-funded state agency” which manages the interstate and off-interstate logo sign program. The blue highway signs provide directional information to traveler services (gas, lodging, food, camping and attractions). Through this partnership, ODOT received a percentage of the revenues generated from the logo sign program to help fund TripCheck development and operations activities. Michigan could explore a similar arrangement with the Tourist Oriented Directional Sign (TODS) program or the logo signing program. Michigan Logos, Inc. administers both of these programs on behalf of MDOT.

5.2 Private Partner Request for Information

Although not a recommendation emerging from the 511 Strategic Plan, in April 2007, Michigan DOT issued a Request for Information (RFI) for a private partner to develop, implement, operate and maintain a statewide 511 service at no cost to MDOT. The RFI was fairly flexible in terms of permitting models that incorporated advertising or fee-based services (to the user), so long as the call for basic services was no charge, and that advertising and sponsorship were permitted as long as they did not interfere with the user’s primary intent for using the service. The RFI asked for a letter of interest which would outline content and geographic scope of the service, private partner business model (or approaches to developing the business model), experience with other phone-based traveler information services, and also requested that the respondent identify what roles or responsibilities MDOT would need to undertake as a result of the partnership.

MDOT received one response to this RFI, and the respondent indicated that it could provide a ‘free’ 511 service for the Detroit metro area. The service would consist of freeway travel conditions (congestion) and incidents, and would include a brief advertisement at the beginning of the message. Any additional call transfers to external entities (such as transit) would be the responsibility of MDOT. Further, MDOT would be responsible for marketing and advertising the service, and would also be responsible for coordinating call routing with telephone providers (landline and wireless) to a toll-free number. The respondent offered a contract term of two years with the option to extend. To date, there is not a historical case study to point to regarding this respondent’s regional 511 service; the only partnership for a regional 511 service between this respondent and a public agency has only been in place for two months, so it is difficult to ascertain overall performance, usability, user acceptance and other factors with such a limited deployment timeframe.

At the time of this Implementation Plan, MDOT is still reviewing the proposal, but has not yet made a decision to accept or reject. MDOT will need to weigh its options: accept the proposal to

implement a 511 service in the Detroit area while it gets the statewide data engine in place to support a statewide service, or wait until MDOT can allocate funds for a statewide program that it will oversee.

5.3 Business Model Options

MDOT is faced with a few options for its 511 program at this time:

1. Do nothing – proceed with the lane closure database and MIDrive web site to provide travelers with statewide road and travel conditions information, but do not implement the phone component;
2. Accept the Navteq/Traffic.com proposal for the Detroit service and implement the call routing to enable 511 calls in the Detroit metro area; or
3. Take the lead with implementing 511 on a statewide basis by allocating funding to develop and operate the service.

Given that other attempts by state DOTs to develop models that will generate revenue to offset some of the DOT operations cost for traveler information have not proven successful, MDOT should not factor the potential for revenue from 511 into its funding plan. There needs to be a commitment on the part of the DOT that traveler information is a core business mission, and therefore worth the investment to deliver this information to constituents. There are other examples of creative partnerships that have helped to off-set DOT funding requirements for traveler information. Earlier in this section, the Oregon DOT partnership with its Traveler Information Council was cited as an example that could apply in Michigan – a percentage of the advertising revenue from highway logo signs was allocated to ODOT's traveler information program, and in fact, funded a good portion of the TripCheck and 511 system development. Options for Michigan could include:

- MDOT could explore an arrangement similar to Oregon's with Michigan Logos, Inc., and designate a portion of the revenue for developing the statewide traveler information tools;
- Partner with the State Police to develop and implement 511. Currently the State Police operate a winter road conditions/hazards hotline during winter months. These are updated at least twice daily. With the planned RWIS throughout the state, MDOT will have real-time weather and pavement condition information. 511 and MIDrive could replace the current State Police weather conditions hotline, ease the burden on patrol officers in the field to update the winter road conditions information, and streamline information available to the public. The State could direct funds to one system instead of two, which would ultimately result in a cost savings.
- AAA Michigan currently operates a statewide road conditions hotline, which is updated daily, and updated several times a day during hazardous winter weather conditions. A companion web site is also operated by AAA Michigan, and provides regional reports, incidents, and allows members to personalize their route information. AAA Michigan manually collects data from a variety of sources throughout the state, including MDOT, and provides a recorded message on its hotline. It also provides recorded message updates to radio stations throughout Michigan. AAA Michigan was involved in some of the outreach activities for the 511 Strategic Plan, and although expressed interest in what MDOT was pursuing, it was not clear their interest in partnering with MDOT. AAA Michigan relies on customers coming to its hotline and website – these provide a good mechanism to advertise services available through AAA. A potential partnership between MDOT and AAA Michigan would need to weigh the benefits to AAA of promoting or supporting a 511 service operated by MDOT.



5.4 Recommended Business Model and Partner Roles

It is recommended that MDOT serve as the lead agency for Michigan's phone and web-based traveler information service, and provide that information on a statewide basis. As the primary stakeholder, MDOT will ultimately be responsible for designing, building, implementing, operating, maintaining, enhancing, marketing, and funding Michigan's initial 511 service. This builds on efforts already underway by the State to enhance the statewide lane closure database, implement an ATMS software for system operations, as well as the MIDrive web site development. As the lead agency, MDOT has the option to contract out portions of its traveler information program, such as the IVR development and system hosting, but still retains ownership and accountability for the 511 brand in Michigan, which will cover the phone and MIDrive web application.

Few, if any, 511 services in the country are successful as a result of the efforts of solely the lead agency. Partnerships among public agencies, as well as additional private partners, are critical to a successful implementation as well as sustaining operations. Other entities will play a critical role in the Michigan 511 program. For the initial service, these include:

- Michigan Public Service Commission;
- Telecommunications Association of Michigan;
- Telecommunications providers (landline and wireless);
- Contracted IVR developer and network host;
- Michigan State Police;
- Local transportation and law enforcement agencies;
- NOAA/National Weather Service.

A summary of the partner roles and responsibilities is included in **Table 2**. As Michigan's 511 service expands and evolves, additional entities are envisioned to become part of the 511 partnership. **Table 3** provides potential roles for these future partners.

Table 3 – Future Partners and Roles

Partner	Role or Activity	MDOT Considerations
AAA Michigan	Potential information source or operational partner.	Explore partnering opportunities for statewide traveler information, which could include consolidating phone numbers and/or web resources.
Neighboring state 511 services (Wisconsin, Indiana, Ohio, Illinois and Province of Ontario)	MDOT's 511 should be configured to provide a menu option for these other services, and transfer the call to the appropriate toll-free number. These other services should provide a similar capability for transferring calls to Michigan's 511.	Initiate mutual call transfer agreements Coordinate with contractor for updates to main menu and call transfer capability. Provide a link to these other states' web-based traveler information systems from MIDrive
Transit operators	Coordinate with MDOT for call transfers from 511 to transit customer service call centers. Will require a toll-free number for 511 to transfer to.	Coordinate with contractor for updates to main menu and call transfer capability.



County Road Commissions and other local agencies	Provide local road information, including closures or incidents on major arterials.	Enhance traveler information database to be able to accommodate arterial road conditions information.
Tourism Information Providers	Provide a point-to toll-free number for 511 callers to be able to access tourism and traveler services information.	Coordinate with contractor for updates to main menu and call transfer capability.
Border Bridge Crossings	Provided automated data feed to MDOT to be able to include up-to-date information about border and bridge crossings, including wait times, fares, etc.	Coordinate with contractor to update main menu to provide an option for border crossing information. Make necessary enhancements to database for an automated data feed.
Private traveler information providers	Provide MDOT with additional data to support their traveler information systems, including corridor travel times and speed, additional weather information, or other content identified by MDOT	Contract with private entities to obtain additional information on statewide corridors. Make necessary enhancements to database for an automated data feed.

Table 2 – Partner Roles and Responsibilities an Initial 511 Service in Michigan

511 Component	Michigan 511 Partner Agency							
	Michigan DOT	Michigan DIT	Telecommunications Association of Michigan and Michigan Public Service Commission	Telecommunications Providers	Voice Hosting Network Provider/Contractor	Michigan State Police	Local Law Enforcement	National Weather Service/NOAA
511 Routing	<ul style="list-style-type: none"> Secure a point-to number for 511 in Michigan (toll-free, statewide number) Develop telecommunications routing conversion strategy Contact telecommunications providers and request 511 routing, obtain and review agreements, negotiate agreements with carriers Maintain tracking table of telecommunications providers, routing issues, status and contact information Coordinate wireless overlap issues with wireless companies and neighboring states Provide funding for switching fees assessed by telecommunications providers 	None.	<p><i>Telecommunications Association:</i></p> <ul style="list-style-type: none"> Provide contact information to MDOT for member companies that would be involved with 511 routing Serve as a liaison to CLEC and ILEC carriers for 511 routing <p><i>MPSC:</i></p> <ul style="list-style-type: none"> Review future tariffs or catalog filings from Michigan telecommunications companies regarding 511 or any N11 filings that could impact 511 Coordinate with MDOT on any issues that require resolution with carriers for routing Review routing fees filed by telecommunications providers, if necessary or if requested by MDOT 	<p><i>Landline:</i></p> <ul style="list-style-type: none"> Route 511 calls to the designated point-to number for Michigan Notify PBX customers of 511 and provide guidance on how to program their on-site PBX system; Troubleshoot any routing issues (if any) identified during system testing <p><i>Wireless:</i></p> <ul style="list-style-type: none"> Identify potential routing and coverage issues and coordinate with MDOT to resolve issues Route 511 calls as requested by MDOT to designated point-to number Reach agreement with MDOT on routing fees (if any) Troubleshoot routing issues (if any) identified during system testing 	<ul style="list-style-type: none"> Establish interface from toll-free number to Michigan 511 telephony service 	None.	None.	None.
Telephony System and IVR	<ul style="list-style-type: none"> Provide funding for design, build, implementation, operations, maintenance, and enhancement of IVR platform Develop request for proposal (RFP) for voice-hosting services network provider Select voice-hosting services network provider to build IVR platform Coordinate with voice-hosting provider to create voice personality Test IVR platform Provide project management and technical support to voice-hosting provider 	<ul style="list-style-type: none"> Develop and maintain a Traveler Information Data Server that the contractor can access. This will be external to MDOT's firewall and traveler information database, and should only contain data to be sent to outside entities for traveler information purposes Coordinate with MDOT to develop specific requirements for contractor to interface with the MDOT Traveler Information Data Server Support testing and debugging of 511 IVR interfaces to the Traveler Information Data Server 	None.	<ul style="list-style-type: none"> Participate in system testing, including verifying routing as well as system load testing. 	<ul style="list-style-type: none"> Develop interactive voice response (IVR) platform Develop call flow diagrams and menus in coordination with MDOT Develop interface between IVR data server and MDOT's Traveler Information Server (external) Develop speech engine with voice recognition and concatenated speech capabilities Configure telephone network interface to provide call transfers (for future transfer capabilities) Allocate adequate amount of phone port capacity from vendor-contracted telecommunications providers Test IVR platform Operate and maintain IVR platform 	None.	None.	None.

Table 2 – Partner Roles and Responsibilities for Development and Implementation of an Initial 511 Service in Michigan (continued)

511 Component	Michigan 511 Partner Agency							
	Michigan DOT	Michigan DIT	Telecommunications Association of Michigan and Michigan Public Service Commission	Telecommunications Providers	Voice Hosting Network Provider/Contractor	Michigan State Police	Local Law Enforcement	National Weather Service/NOAA
Traveler Information System Database	<ul style="list-style-type: none"> Coordinate with MDIT to implement processes and procedures for MDOT Region staff to enter information into the lane closure database Monitor lane closure database to be sure information is accurate and timely Provide funding to develop the Traveler Information Database and ongoing operations and maintenance costs related to the database and supporting systems Finalize the content categories, sources, and format of information to be included in the initial 511 service Designate central repository for traveler information, and coordinate with MDIT to implement as an external server that the 511 contractor can access Develop data sharing agreements with other participating information providers, including training for additional agencies that will have data entry access for the lane closure database and/or ATMS. 	<ul style="list-style-type: none"> Configure MDOT Traveler Information database for weather-related road condition, incident, special event, and emergency alert information manually input into the lane closure database Configure Traveler Information database for automated feeds from the ATMS Configure Traveler Information database for automated feeds from National Weather Service (or other weather information provider) Configure Traveler Information database for automated feeds from MDOT RWIS Coordinate data transfer consistency between the external server/contractor, and information presented on MIDrive Monitor and maintain the external server that contractor will access Host and maintain the external Traveler Information Data Server Coordinate with contractor to resolve issues with the external server and contractor IVR 	None.	None.	<ul style="list-style-type: none"> Provided needed coordination and input on any changes to fields or additional information fields needed for the IVR translations 	<ul style="list-style-type: none"> Provide incident information to MDOT Regions for entry into the lane closure database and ATMS Future capability could include MSP access for incident entry Coordinate with MDOT and MDOT to develop incident reporting component requirements 	<ul style="list-style-type: none"> Provide incident information to MDOT Regions for entry into the lane closure database and ATMS 	<ul style="list-style-type: none"> Coordinate with MDOT to establish weather information feed to the Traveler Information Database to provide forecasted weather conditions on 511 and MIDrive

Table 2 – Partner Roles and Responsibilities for Development and Implementation of an Initial 511 Service in Michigan (continued)

511 Component	Michigan 511 Partner Agency							
	Michigan DOT	Michigan DIT	Telecommunications Association of Michigan and Michigan Public Service Commission	Telecommunications Providers	Voice Hosting Network Provider/Contractor	Michigan State Police	Local Law Enforcement	National Weather Service/NOAA
Marketing	<ul style="list-style-type: none"> Provide funding for marketing of initial launch and ongoing marketing efforts Develop formal marketing plan, including proposed budgets, timeframes, and activities. Coordinate with MDOT public information officers and resources for plan development Develop promotional and outreach materials Implement marketing and outreach campaign, including program launch, statewide media coordination, advertising, and distributing promotional material Track usage of 511 and MIDrive to support performance monitoring as well as identify potential focus areas for additional outreach Coordinate placement of MIDrive and 511 links on partner agency web sites Implement processes to include MIDrive and 511 within all MDOT news releases involving closures, weather notifications, incidents and planned special events. 	None.	<i>Telecommunications Association:</i> <ul style="list-style-type: none"> Issue notification of launch to member companies throughout the state. 	None.	None.	<ul style="list-style-type: none"> Provide link to MIDrive from the MSP web site Promote availability of 511 and MIDrive to precincts throughout the state 	None.	None.

Table 2 – Partner Roles and Responsibilities for Development and Implementation of an Initial 511 Service in Michigan (continued)

511 Component	Michigan 511 Partner Agency							
	Michigan DOT	Michigan DIT	Telecommunications Association of Michigan and Michigan Public Service Commission	Telecommunications Providers	Voice Hosting Network Provider/Contractor	Michigan State Police	Local Law Enforcement	National Weather Service/NOAA
Operations	<ul style="list-style-type: none"> Monitor performance and call volumes for 511 Coordinate with MDOT Regions to be sure information is being accurately and thoroughly entered into the lane closure database and ATMS Distribute notices of any 511 and MIDrive updates to MDOT Regions Coordinate enhancements with MDIT and contractor Monitor performance and responsiveness of contractor Coordinate with MSP, Tourism, Transit, and neighboring states to discuss future enhancements and call transfers Allocate appropriate funding to sustain operations of 511 and MIDrive 	<ul style="list-style-type: none"> Work with MDOT and 511 Contractor to monitor system performance and operations; Monitor interfaces from IVR to MDOT's Traveler Information data server (external); Monitor and troubleshoot lane closure database and interface to the MDOT Traveler Information Database; Coordinate with MDOT on incorporating additional data into the Traveler Information database, such as from external private partners Coordinate with MDOT and MSP on a potential future CAD interface; Configure Traveler Information Database as additional phases of the ATMS are implemented statewide. 	None.	<ul style="list-style-type: none"> Maintain 511 routing to the identified toll-free number Respond to requests from MDOT to verify routing if feedback from customers is indicating a problem Notify MDOT of any changes in tower or network configurations that could impact 511 routing. 	<ul style="list-style-type: none"> Monitor IVR operations and interfaces to MDOT's external Traveler Information Server Provide usage statistics and status reports to MDOT each month, including number of calls per day, operational performance information (system down-time) Update MDOT on any abnormal call volumes or IVR/telephony activity Provide enhancements to IVR platform on an as-needed basis (in accordance with contract terms, and in coordination with MDOT and MDIT) 	<ul style="list-style-type: none"> Continue to provide MDOT with road weather conditions updates. Partner with MDOT to enhance the incident reporting data collection process. 	<ul style="list-style-type: none"> Continue to provide MDOT with road weather conditions updates. Partner with MDOT to enhance the incident reporting data collection process. 	<ul style="list-style-type: none"> Continue to provide MDOT with road weather conditions updates and weather forecast information.



SECTION 6 – TELECOMMUNICATIONS ROUTING ISSUES AND STRATEGY

Call routing is a critical component of any 511 service. In order for callers to be able to access the information via 511, wireless and landline telecommunications carriers must implement programming that translates 511 in the calling area to a designated number – typically a toll-free number (to eliminate long distance charges). Call routing issues were discussed and documented as part of the *Technical, Institutional and Regulatory Issues* technical memorandum. As part of the Strategic Plan, a Telecommunications Round Table meeting was held in Detroit, where landline and wireless phone companies participated, as did the Telecommunications Association of Michigan.

Since the development of the Strategic Plan, there have been numerous changes in the telecommunications landscape in Michigan. The primary Incumbent Local Exchange Carrier (ILEC), SBC Communications, is now AT&T. AT&T is estimated to have more than 62% of the wireline market share in Michigan, Verizon has just over 12%, and the remaining market share is split among several smaller Competitive Local Exchange Carriers (CLEC)s. (*Status of Telecommunications Competition in Michigan*, June 2006, Michigan Telecommunications Association). On the wireless side, several mergers have occurred among the major national providers: Cingular is now AT&T Wireless, and Sprint and Nextel have merged. While these mergers on the wireless side may have little impact on the overall call routing, it is important to note that as tower and switch networks are combined among companies, there may be additional coordination required to ensure that they are all routing to the correct toll-free routing number for Michigan's service.

6.1 Landline Call Routing Issues and Considerations

In preliminary discussions with representatives from the telecommunications industry, several potential institutional issues related to call routing were identified. MDOT will need to take the following issues into consideration when developing the call routing agreements and coordinating with landline communications providers:

- Carriers and providers state the easiest call routing configuration is to route calls to a single statewide toll-free number as telecommunications coverage areas do not necessarily align with political or geographical boundaries;
- The advance notice required by carriers and providers to perform the call routing varies from 30 days to several months;
- The call routing charges provided by the telecommunications industry are only estimates and the actual fees may vary;
- Some of the draft call routing agreements state that 511 calls will not be routed from certain locations, such as hotels or payphones;
- The Telecommunications Association of Michigan should be consulted to assist in coordinating 511 call routing with its members;
- Payphone operators may have to be contacted separately to coordinate routing from payphones; and
- Private branch exchange (PBX) and Centrex customers will need to be programmed to perform 511 call routing. This will be the responsibility of the PBX customer and not the phone company/provider.



MDOT will need to enter into call routing agreements with each of the landline carriers and wireless providers who are performing the 511 call routing. MDOT will need to review and negotiate the terms of the agreements with each company; tariffs (if applicable) will need to be reviewed, as they may contain restrictions on N11 calls. Generally speaking, tariffs are difficult to negotiate, particularly cost. In some instances, 511 tariffs were developed based on other N11 tariff language, which restricted calls from certain businesses or institutions. Experience with other states indicates that some carriers may be open to modifying this language on a case-by-case basis. Routing for landline phones is fairly straightforward, but MDOT should expect to pay one-time charges for implementing the routing for the larger landline carriers (AT&T, Verizon, CenturyTel, and others). Many of the smaller carriers with a limited number of switches may offer to implement the 511 routing at no charge.

Early in the Strategic Plan discussions, SBC (at the time the largest ILEC in Michigan) indicated a pricing structure that included monthly recurring charges. A March 2007 catalog filing by AT&T Michigan (f/k/a SBC) for 8-1-1 call routing was submitted to the Michigan Public Service Commission. (In March 2005, the FCC designated 8-1-1 as the nationwide number for contractors and others to call before conducting excavation activities). In this filing, AT&T outlines a pricing structure that is \$253.02 per central office switch, without any recurring charges. This establishes a favorable precedent for a similar strategy for 511, and should be pursued by MDOT with the MPSC. With close to 200 central offices that would require switch programming, this could result in a significant cost savings for MDOT over the previously discussed 511 routing rate schedule. Section 6.3.3 provides additional cost detail for telecommunications routing.

6.2 Wireless Routing Issues and Considerations

With the nature of wireless networking and the number of providers operating in Michigan, it is inevitable that there will be some wireless call routing issues and/or conflicts. At present, there are not any neighboring states that have an operational 511 service, but in a few years' time, it could be feasible that Wisconsin, Illinois or Indiana (which are all in the planning stages) could implement 511 and already have wireless routing in place. In these cases, coordination with the individual wireless providers will be needed to resolve any conflicts.

In coordinating call routing with the telecommunications industry, MDOT needs to be aware of several technical issues related to call routing, including the following:

- Some providers are only able to route 511 calls to a toll-free number, so if the ten-digit number assigned to the 511 service is not toll-free, some providers could not perform the call routing;
- Because wireless calls are generally routed at the switch level, callers in border areas may get routed to the 511 service of an adjacent state, or may not be able to access the 511 service at all;
- Wireless calls in areas near the international border with Canada could potentially result in international surcharges for the caller, depending on which side of the border the nearest cell tower is on;
- Wireless coverage is incomplete in some of the more rural portions of the state, especially the Upper Peninsula, so travelers in these areas may not be able to access 511 via a wireless phone; and
- If a caller dials 511 via Voice over Internet Protocol (VoIP) technology, it is difficult to guarantee that the caller will be routed appropriately unless the caller has provided a current default address to the VoIP provider.



Most wireless providers have agreed to route 511 calls at the switch level to one toll-free number per state – this is a consistent policy that they work with for 511 implementations around the country. There are a few wireless providers that are willing to provide more precise tower-level routing; some will do this at no charge to the 511 implementing as a matter of better serving their customers while others do impose a nominal cost-recovery charge for ongoing tower routing maintenance.

The national wireless companies (T-mobile, AT&T, Sprint/Nextel, etc.) typically request that an agreement be in place between the DOT and the wireless company prior to them initiating any routing. These agreements are straightforward – they outline what the wireless company will and will not provide, acknowledge that they will route calls to the toll-free number provided by the requesting agency, and include limitations on their liability for call routing. The Verizon Wireless agreement contains language that some states will not sign; however, there are good precedents established in other states for negotiating more favorable language and terms with Verizon Wireless. If there are any costs associated with tower-level routing, those should be part of the agreement as well. Wireless companies typically require at least 30 days notice for routing; it is recommended that 90 days' notice be provided to allow for system testing.

6.3 511 Routing Strategy and Process

6.3.1 Call Routing for Initial Statewide Launch

As the lead agency for 511, and with the FCC designating 511 for government agencies, MDOT will need to lead coordination with the landline and wireless carriers for 511 routing. If MDOT proceeds with selecting a contractor to develop and operate its 511 service, it is recommended that MDOT coordinate with the contractor in securing a toll-free number for call routing.

In conjunction with that effort, MDOT (or a designee) needs to contact each carrier that would need to route 511 calls to:

- Notify them of the planned 511 service;
- Identify a technical and/or regulatory contact;
- Request agreements or tariffs regarding 511 routing or service;
- Identify lead time required by the carrier for implementing the necessary routing and switching; and
- Identify number of switches (or central offices) that would need to be routed, as well as any costs associated with implementing 511 routing.

Because of the different network configurations for wireless communications, there will need to be additional coordination with wireless companies to identify:

- Gaps in switch coverage areas.
- Overlapping switch coverage areas with other states or with Canada, which may require some tower-level routing (there may also be costs associated with tower level routing). In some cases, carriers will require authorization from a neighboring state if there are routing strategies implemented that could impact callers in those neighboring states.
- Any subcontracted wireless companies (national wireless companies may have agreements with smaller regional providers as a means of expanding their coverage area.



Table 4 presents a list of landline and primary wireless carriers that are envisioned to participate in Michigan's statewide 511 program. The Telecommunications Association of Michigan indicated that it could help facilitate identifying contacts with their member agencies. VoIP providers will also need to be contacted; at present, **Vonage** and **Comcast** are the primary providers, but MDOT will need to monitor the VoIP industry for any new companies. Payphone operators will also need to be contacted, and there is an association that can facilitate coordination with their members. These payphones will likely utilize telecommunications infrastructure that is supported by one of the carriers in the landline list, but there may be issues to enable 511 calls from payphones that will need to be addressed separately from the network or central office call routing.

Table 4 – Landline and Wireless Carriers in Michigan.

Landline Carriers	Primary Wireless Carriers
AT&T Michigan (f/k/aSBC)	Alltel Communications
Verizon	AT&T Wireless (formerly Cingular)
Ace Communications Group	Sprint/Nextel
Allendale Communications	T-Mobile
Baraga Telephone	Verizon Wireless
Barry County Telephone	CellCom
Blanchard Telephone	Centennial Wireless
Bloomington Telephone	Leap Wireless (Cricket)
Carr Telephone	Dobson Wireless
CenturyTel Chapin Telephone	Excel Communications
Chippewa County Telephone	Metro PCS
Climax Telephone	Thumb Cellular
Deerfield Farmers' Telephone	TracFone
Frontier Communications	
Hiawatha Telephone	
Kaleva Telephone	
Lennon Telephone	
Midway Telephone	
Ogden Telephone	
Ontonagon County Telephone	
Peninsula Telephone	
Pigeon Telephone	
San Creek Telephone	
Springport Telephone	
TDS Telecom	
Upper Peninsula Telephone	
Waldron Telephone	
Westphalia Telephone	
WinnTelephone	

6.3.2 *Call Transfers to Outside Entities*

Although not envisioned for an initial statewide system, 511 should also be capable of transferring callers to external systems for additional information. These could include:

- Transit agencies;
- Neighboring states' 511 services (when available);
- Tourism and travel services; and
- Airports.

To enable call transfers, the 511 IVR needs to be configured to allow callers to select an option for an outside agency, and then transfer the call to an assigned number. The challenge with call transfers is that if the IVR is located out-of-state, and the number that the call is getting transferred to does not have a toll-free number, there will be long distance charges incurred with that transfer. Neighboring state 511's will likely have a toll-free number to provide to MDOT; similarly, MDOT can provide its toll-free termination number to neighboring states to include as a transfer option on their menus. This is done under a "mutual call transfer" agreement – each state agrees to make a transfer available to the other, and agrees to pay any fees/minutes associated with that transfer. A tourism entity, such as Travel Michigan, also has a toll-free number.

The challenge with call transfers is typically transit – most transit providers do not have a toll-free number established. They serve a localized area, therefore there is not a need for them to make a toll-free number available to their local customers. MDOT will need to decide if it wants to incur toll charges to make transit information available via 511. Other states have indicated that the number of transfers from the main 511 menu to a transit agency does not have a significant impact on cost or call volumes. This will depend on how much the 511 service is marketed as a transit information resource.

6.3.3 *Estimate for Call Routing*

Coordinating with telecommunications carriers to route the abbreviated 511 dialing code to a specified point-to number is required before any calls can be made. Call routing fees and charges typically apply just to landline carriers, but depending on the precision of wireless routing needed, some wireless providers may request some level of cost recovery. Call routing charges could be significant, depending on which landline carriers and wireless providers are requested to enable 511 call routing for their customers.

Discussions with both landline and wireless providers in Michigan during the Strategic Plan (2005) indicated that cost for routing could be significant. Both SBC and Verizon noted that both a one-time set-up/programming fee as well as monthly recurring charges would apply. It is important to note that for Verizon landline, **this monthly recurring charge is not consistently applied in other states**, which gives Michigan some leverage in discussions and negotiations. Verizon also provided a set-up charge for Michigan of \$515 per central office; for other states, Verizon averages between \$300 and \$500 per central office. MDOT should pursue negotiations for more favorable terms given the precedent established in other states. MPSC involvement may be needed.

Furthermore, SBC (now AT&T) indicated that there would be a charge of \$900 per central office to enable 511 routing, which would equate to a one-time charge \$158,000 for the 175 central offices (plus recurring charges). **A March 2007 filing from AT&T Michigan for**



811 routing showed a routing charge of only \$253.02 per central office, for a very similar configuration to what 511 would need (e.g., routing to one toll-free number statewide). This March 2007 filing for 811 does not indicate any recurring charges. This marks a substantial reduction in the implementation charges, and sets a very good precedent for eliminating the monthly recurring charges for 511. Further discussions with AT&T would be needed, and MPSC will need to be involved.

Table 5 shows the estimated 511 call routing charges for Michigan if call routing is performed statewide by both landline and wireless entities. This estimate is based on discussions with carriers and input from the Michigan Telecommunications Association, and information provided in 2005. Non-recurring charges refer to those fees that are required to program central switches or central offices. These are one-time costs to establish the service and implement the appropriate switching. Annual recurring charges are imposed by the landline carriers for ongoing maintenance of the central office switch. Recurring charges are assessed on a carrier-by-carrier basis; not all landline carriers have a policy to impose recurring charges for N11 switching. SBC and Verizon, for example, have indicated that, at present, they do have recurring charges for N11 implementation, but most of the smaller carriers have indicated they do not have recurring charges.

Table 5 – Estimated 511 Call Routing Charges

Entity	Non-Recurring Charge	Annual Recurring Charge
Landline Carriers	\$ 230,000	\$ 20,000
Wireless Providers	\$ 20,000	\$ –
Total	\$ 250,000	\$ 20,000

If MDOT is able to negotiate more favorable terms with both AT&T and Verizon, costs for landline routing could be significantly reduced. Using the 811 precedent in Michigan, AT&T implementation costs could be closer to \$50,000. Verizon landline has approximately half of the number of central offices that AT&T has in Michigan, but their higher charge per central office results in close to the same dollar amount (\$48,000). This will result in approximately \$100 – \$125,000 for landline routing – almost half of what was initially proposed by these carriers.

MDOT should also allocate funding to cover any wireless routing charges that may result from tower-level routing. These charges will not be able to be fully determined until wireless providers begin the actual routing implementation. A budget of \$20,000 should be allocated to cover these potential charges. Because there are no active 511 services in any neighboring state, wireless bleed-over into other states may not be a significant issue in the near-term, but as these states implement their own services, more precise call routing may need to be addressed. Some providers (such as Verizon Wireless) require consent from a neighboring state if there is significant overlap in switch coverage areas.



SECTION 7 – MARKETING STRATEGIES

Promoting awareness of the availability of 511 for traveler information in Michigan will be a critical element in the overall implementation and sustaining operations of the service. Marketing the service and MDOT's role in delivering the phone and web-based traveler information need to consider several factors, including:

- How traveler information will be branded in Michigan to include both phone and web based tools;
- Strategies for co-branding 511 with the MIDrive web site;
- Partnering with media statewide to promote 511 and MIDrive as traveler information resources;
- High impact, low-cost strategies that will provide sustaining exposure to 511;
- Role of MDOT staff in leading the marketing and outreach effort; and
- How to utilize a network of public and private partners to provide several channels for awareness.

This section includes lessons learned from other states' marketing and outreach activities for their traveler information systems. It also includes strategies for co-branding phone and web traveler information tools, as well as preliminary recommendations for media coordination, involving partners to help market Michigan's 511, and potential cost considerations to implement a marketing plan.

7.1 511 Marketing Best Practices from Other States

Marketing, outreach and promoting awareness of 511 is an integral part of implementing and launching a 511 service. With numerous statewide 511 services in operation, there is a wealth of 'lessons learned' to be obtained from other deployers. Marketing is often viewed as a challenge – many DOTs have very little experience in broadly marketing a function or service to the general public. 511 and related traveler information systems are a very visible service that has been developed with public sector resources; making the traveling public aware of these tools, and the DOT's role in developing and operating them, is an important component to long-term public usage and support for continued operations.

As part of developing some initial strategies for Michigan, the project team has documented lessons learned and marketing focus areas from other states that have launched and are operating statewide phone and web-based 511 systems. The following provides some insights and guidance from other deployers:

- **Agency community relations/public information staff** typically lead the development and execution of their 511 marketing campaigns. Some may supplement with marketing firms or other consultant support. Several states, including Virginia, Oregon and Utah indicated that their district or regional PIOs were actively involved in marketing and outreach at the local level. There were few other public sector partners involved in marketing.
- **Media is viewed as a key partner** in promoting 511. By providing media with consistent facts and information, they can better present 511 as part of features, stories, or through on-going mentions as part of traffic or weather reports. States encourage ongoing partnering with media by promoting 511 as part of press releases with winter and holiday driving tips.
- **Branding phone and web-based traveler information** varies from state to state. Many states have opted to co-brand their web services with the 511 brand, such as www.511virginia.org; www.az511.gov, www.511ksdot.org, etc. Other states, such as Oregon and Utah, already had a very established web brand for traveler information prior to 511 being implemented.



- A **511 launch** provides an excellent opportunity for a focused marketing campaign. Several states have had a very formal launch, including a media event with the governor or transportation commissioner making the first official call. Other states have opted to issue press releases to announce the availability of 511 phone and/or web based tools.
- Most states have installed **roadway signage** with the 511 logo (MUTCD Standard blue with the AASHTO 511 logo). Some states use the logo as a stand-alone image but others have found it more effective to include a tag line, such as “Dial 511 for Travel Info”.
- **Paid advertising** for 511, such as radio ads, is an effective but costly strategy. Some deployers have opted for very focused timeframes for paid media – such as the launch or in advance of major holiday weekends. Others have opted for **Public Service Announcements (PSAs)**, for radio and TV to promote availability of 511. Virginia had the governor to record two PSAs that were distributed to local radio channels. PSAs do not come with the high price tag of paid radio spots during prime drive times; however, MDOT would have little control over when or how often the PSA was run.
- **Marketing budgets** and level of investment in marketing varies from state to state. Typically, metropolitan area systems (such as the San Francisco Bay Area or Southeast Florida) see larger investments in marketing than statewide systems. Many statewide 511 marketing efforts are in the range of \$50,000-\$100,000 for the first two years, which includes a launch, promotional material, roadside signage, and other strategies. Several agencies acknowledged that targeted marketing efforts had subsided following the initial launch – ongoing media releases, roadside signage, and co-promotion with partners were cited as key long-term strategies.
- **Collateral materials** varied from state to state, but most states produced some type of brochure or rack card with information about 511, usage tips, and Frequently Asked Questions (FAQs). Trinkets and giveaways included pens, keychains, pins, litter bags and various other imprinted materials.

7.2 Identity and Co-Branding with MIDrive

Establishing 511 as a ‘brand’ for phone-based traveler information in Michigan will require focused outreach and promotion. To support states in their 511 marketing efforts, the 511 Coalition has developed a **national 511 logo**, which is creating awareness of and a consistent look for 511. This logo, which can be used as a stand-alone graphic or accompanied by an AASHTO-approved tag line (several accepted taglines have already been established as part of the national 511 marketing activities), creates a brand awareness for 511 that is easily recognizable. Color, size, spacing and other logo guidelines are available from the 511 Coalition.

The logo can be used in black, white or blue. The Marketing and Outreach Subcommittee of the 511 Coalition has recently updated the 511 logo style guide, which specifies font, sizing, space in relation to other logos, color restrictions and other guidelines. The logo trademark is registered to AASHTO, but is available for deploying agencies to use.



Michigan DOT is currently in the process of developing a new traveler information website that will be identified as www.MIDrive.com. This site currently provides traveler information for the



Detroit metropolitan area, but MDOT plans to expand this site to provide statewide road, travel and weather conditions. This expansion is closely tied to other enhancements currently underway to update the statewide lane closure database and integrate that with a map display.

While some states have opted for 511 to become the brand for traveler information, and in fact have chosen to incorporate 511 as part of their web-based URLs, Michigan will be launching the web component prior to the 511 phone component, thus MIDrive will be the first ‘brand’ launched to the public.

As an example, the Oregon DOT had been operating www.TripCheck.com, and had made significant investments in advertising TripCheck as the statewide resource for road and travel conditions. TripCheck was a very recognizable and established tool, so when ODOT converted its toll-free number to 511, it did not change the web URL. ODOT now promotes 511 as “TripCheck information by phone”. Similarly, Utah DOT established the www.utahcommuterlink.com, which was well-recognized as a UDOT resource for traffic conditions in the Salt Lake City metro area. UDOT expanded its Commuterlink site to include statewide road and weather conditions. When 511 was launched in 2001 (prior to the Winter Olympics), UDOT did not want to impact or detract from the brand it had established with the Commuterlink program.

Co-branding 511 with the web-based MIDrive.com can be accomplished without using a 511-based URL or modifying any logos or taglines used as part of the website. Michigan would not change the name of the website, modify the URL, or add a second web address. Instead, a 511 section could be added to MIDrive.com, with a prominent link from the main page. The graphic should use the AASHTO-approved 511 logo, and tie the information available from 511 back to MIDrive.com. This would allow some cross-promotion of 511, and link 511 as a way to access MIDrive information by phone.

7.3 511 Marketing Strategies for Michigan

Based in part on a review of other states’ previous marketing efforts, as well as an understanding of Michigan’s goals and objectives in promoting the statewide 511, several potential marketing strategies were identified. Michigan’s marketing efforts should focus on the following key areas:

- Media Relations Plan;
- Public Information and Awareness;
- Partner Co-Promotion; and
- Collateral Materials.

Activities that could be considered “high impact/low cost” were preferred, meaning those activities that would be most likely to reach a large number of potential users at a reasonable cost. Many of these strategies encompass ongoing promotion of 511 and MDOT’s traveler information tools. The following subsections provide additional detail of recommended marketing strategies within these focus areas.

7.3.1 Media Relations Plan and Outreach

Media, including radio, television and print, will be MDOT’s most powerful public awareness tool for 511. MDOT will need to actively coordinate with and educate its media partners about the 511 system, its benefits, and encourage continued promotion of the service as part of routine as well as during extraordinary situations (such as storms, major events, major closures or incidents). A carefully executed media relations program will help to keep 511 in the news long after the launch event.



An integral media opportunity could be a formal 511 launch. Providing media with information about 511 and the MIDrive web site in advance of the launch date will help to generate mentions and potentially articles about MDOT's traveler information services. Scheduling a press conference/media event will

The Media Plan for 511 is aimed at generating statewide interest and awareness among media to provide ongoing coverage and mentions of 511, which will serve to promote Michigan's 511 through "legitimate" (non-paid, non-sponsored) coverage. Beyond the initial roll-out, it will be important to continue to provide media releases promoting the 511 and web service. MDOT can periodically send releases to media to prompt coverage – in advance of major holiday driving weekends, as part of long-term construction or closures, major special events, and important 511 milestones (such as the 1 millionth call, one year of service, etc.).

Key components of the Media Relations strategy are shown in **Table 6**.

Table 6 – Media Relations Strategies

<p><u>Media Contacts/511 Media Database</u></p> <p>Develop a media contact list of statewide print and broadcast media. Public information officers for state and non-state agencies should also be included on the 511 media contact list.</p>	<ul style="list-style-type: none"> ▪ AM and FM Radio stations ▪ TV news stations (weather and traffic reporters) ▪ Newspapers (major dailies, as well as weekly and/or regional publications) ▪ Special interest magazines and publications, with an emphasis on tourism (coordinate with Travel Michigan and the MEDC) ▪ Private sector traffic information services ▪ AAA Michigan ▪ Michigan State Police ▪ Michigan Trucking Association ▪ Cities, counties and County Road Commissions ▪ Transit
<p><u>511 Launch Media Event</u></p> <p>A media event to launch the 511 system will be the first public notification that Michigan has made this service available to travelers. Broadcast and print media from throughout the state should be invited to attend, and should be provided with a press release and media kit in advance of the event.</p>	<p>Media Kits should include the following:</p> <ul style="list-style-type: none"> ▪ Press release ▪ Background on Michigan's 511 ▪ FAQ's and tips for using the system ▪ National 511 deployment status ▪ MDOT contact information ▪ Coalition 511 brochures
<p><u>Ongoing media releases</u></p> <p>MDOT will have an opportunity to promote 511 and MIDrive with each media release it issues. Transportation or weather advisories, major construction projects, enhancements to the traveler information service and others should include a short description of 511 and MIDrive, and encourage travelers to use these resources for up-to-date information.</p>	<ul style="list-style-type: none"> ▪ Send media release in advance of major holidays and high-volume driving weekends (Labor Day, Thanksgiving, Christmas) long-term construction projects, and emergency news releases about incidents or weather impacting roadways and travel. ▪ Send 'trigger' media releases to generate news coverage. Suggestions include 511 milestones (500,000 or 1 millionth call, 10 millionth web hit, or at the 6 month and one year system launch anniversaries). 'Triggers' can also include announcements of major enhancements, such as when additional information gets added to 511 or MIDrive.



7.3.2 *Public Information and Awareness*

There are numerous strategies that MDOT can implement aimed at broad-based education and awareness of the 511 and MIDrive traveler information tools. Coupled with a media program, these strategies will serve to reach a large audience of potential users.

Roadway signage – MDOT should consider purchasing and installing approximately 50 highway signs in conjunction with the initial launch of the 511 service. These signs should initially be placed in strategic locations, primarily along freeways in and around major urban population centers. Care should be given to not placing roadway signs in areas where there are known cell phone coverage gaps. The MUTCD has a standard for the 511 traveler information sign.

Dynamic Message Signs (DMS) can be used to display messages about the availability of travel information via 511. Using DMS to promote 511 has been an issue in other states, due to operational policy limiting the use of DMS to operational or incident information. Operations and policy perspectives interpret stand alone messages such as “Dial 511 for Travel Info” or “Travel Info Dial 511” as advertising. To help balance this perception, other states have incorporated “Dial 511 for Info” as part of other incident messages, such as for closures, incidents, hazards and other restrictions. Several states are also using DMS to provide motorists with AMBER Alert information, with additional information being available on 511.

Paid advertising through radio spots has been demonstrated as an effective 511 outreach tool in several states, including Iowa, Kansas, the Bay Area, and others. However, paid radio ads come at a high price – 10, 15 or 20-second radio spots during peak drive times on popular radio stations are at a premium because they have the potential to reach several thousand drivers while they are en-route. For this reason, it is not recommended that paid advertising form the basis of MDOT’s 511 promotional efforts. While limited purchase of advertising time on radio stations in major markets could be successful, it is recommended that MDOT focus on public service announcements as a means of reaching users via the radio airwaves.

Public Service Announcements (PSA’s) are an alternative to paid advertising; they are relatively low-cost to develop and do not require payment for airing. Most commercial radio stations have an annual target for number of PSAs run. To help raise awareness following the initial launch of 511 in Michigan, a 511 PSA should be developed and distributed to radio (AM and FM) contacts throughout the state. Follow-ups with the radio stations will help to encourage them to play the PSAs.

7.3.3 *Partner Co-Promotion*

Promoting Michigan’s 511 and MIDrive will require establishing a network of partners, both public and private, to help get the word out about these traveler information resources in Michigan. These partners can help to promote 511 and MIDrive by including press release info and features about 511 in their newsletters (both print versions as well as on web sites) and providing links to MIDrive on their web sites. Combined with coverage and stories in print and broadcast media, promoting 511 and MIDrive through other partners will provide increased coverage and exposure on a statewide level.

The plan should include MIDrive web links on the following:

- Tourism sites: MEDC/Travel Michigan (www.travel.michigan.org); www.travelmichigan.com; regional sites (such as West Michigan Tourism, Southwest Michigan Tourist Council, Great Lakes Information Network, and others);
- Michigan Trucking Association (www.mitrucking.org);
- Michigan International Speedway (www.mispeedway.com);
- City web pages and County Road Commission pages;
- Transit web sites; and
- ITS Michigan.

Other partner co-promotion strategies to consider including as part of Michigan's marketing plan are:

- Michigan Travel Ideas ad or feature story (annual travel guide published by the MEDC);
- 511 logo and MIDrive web address on the Michigan state maps; and
- Feature story in the Michigan.org monthly electronic newsletters. Short articles can also be placed in various publications to key target audiences, such as CVO/trucking.

7.3.4 Promotional Material

MDOT's marketing and outreach will be supported by several collateral pieces that are intended to be multi-purpose, have statewide applicability, be cost-efficient, have a long shelf-life, and can be widely distributed. The following are examples of collateral and promotional material that can be prepared to promote recognition of 511 and MIDrive and its availability in Michigan.

- Rack Card – provide an overview of the services, how to access information, what information is available. Design to fit rack card standard, and distribute to Michigan Welcome Centers, airports, rental car companies, hotels, attractions, restaurants, and other venues.
- Media Kit – develop pocket folders with informational pieces, including the rack card, Frequently Asked Questions, Michigan 511 and MIDrive project background, national 511 program information, and other information. Provide to media or partner agencies as a comprehensive guide to MDOT's traveler information resources.
- Other promotional items, such as litterbags, vehicle window clings or bumper stickers pens, keychains and similar giveaways. These are beneficial to have as part of the launch or to provide as giveaways at MDOT booths, public meetings for various MDOT projects, and other venues.

7.3.5 Materials Available from National 511 Coalition

The National 511 Coalition has made various materials available to deployers to support their 511 marketing and outreach efforts. It is recommended that MDOT make use of the following materials to help offset design and production costs:

- 511 logos – provides a national 'identity' for 511 services across the country. AASHTO has the trademark, but it's available to deployers for use as part of their materials.



- National 511 Brochure – provides a layman’s terms overview of the 511 program and goals
- 511 stickers – can be used to customize pocket folders.

7.4 Marketing Costs

Anticipated marketing costs for Michigan’s 511 traveler information telephone service will depend in large part on the specific strategies selected for implementation. **Table 7** provides a high-level estimate of potential marketing costs for a Year 1 scenario. These identify just direct costs and do not capture MDOT staff time. Roadside signage is a one-time cost for the first year, but it does account for a significant portion of the overall marketing budget. Costs will vary based on type of launch MDOT chooses as well as level of marketing. For subsequent years, it is recommended that MDOT include a budget item for ongoing marketing; \$25,000 – \$50,000, depending on longer-term strategies pursued by the department.

Table 7 – Cost Item Estimate for 511 Marketing

Strategy	Quantities	Cost
Roadside Signage (designed, produced and installed)	50 @ \$750.00	\$37,500.00
Media Kit Folders	350 @ 10.00	\$3,500.00
Rack Cards (designed and printed)	100,000	\$7,000.00
Other collateral/printed material/brochures		\$10,000.00
Public Service Announcements (production and distribution)	2 @ 1,500	\$3,000.00
Launch Event		\$10,000.00
Advertising (paid media)		\$10,000.00
Giveaways (pens, key chains, etc.)		\$5,000.00
TOTAL		\$86,000.00



SECTION 8 – IMPLEMENTATION STRATEGY

Implementing 511 in Michigan will require a phased approach in order to establish key data sources, processes and policies throughout the MDOT regions. Phasing will also be important to be able to build on the efforts of MDOT and MDIT to establish the MIDrive web-based traveler information tool for the Detroit area, and will need to closely coordinate as the MIDrive is expanded to serve as a statewide web traveler information tool. MDOT will also be implementing an ATMS in phases, and this will serve as a valuable data source for metro area conditions and future RWIS data.

This section describes the key implementation steps and strategies recommended for the Michigan 511 service. It also includes a schedule and notes key dependencies.

8.1 Phasing and Coordination with Other Efforts

Michigan's 511 service is very dependent on enhancing the statewide database for planned closures, incidents and other disruptions to the state's transportation system. It will also be important to implement processes to ensure consistency of information input from the various MDOT regions. Coordinating the development of the 511 requirements with the lane closure database and future ATMS may mean some modifications to these systems in order to support the specific fields, information types and content so it will translate smoothly into succinct information presented to callers via the telephone.

The lane closure database provides the foundation for both the 511 and MIDrive statewide traveler information programs. Presently, the MIDrive web site provides freeway congestion, alerts, CCTV images and incident information for the Detroit metropolitan area. MDIT is actively working on an enhancement to the lane closure database (including linking to GIS maps) that will provide a statewide view of planned road closures and construction activity. Linking this statewide database with the metropolitan area freeway management systems (ATMS) and other statewide systems (such as RWIS) will provide users with a dynamic interface to current road conditions data for Michigan. With the planned roll-out for the ATMS implementation, 511 and MIDrive will be further enhanced with Grand Region metropolitan area data.

Figure 5 shows the relationship of important system development and implementation to support the 511 service in Michigan. A timeframe is included to provide a context for phasing of key elements. A more detailed schedule of 511 development activities is shown in subsection 8.4. MDOT may choose to launch a 511 service outside of the winter driving season to allow for a few months of 'burn in' and additional testing prior to launching the system at the height of peak call potential.

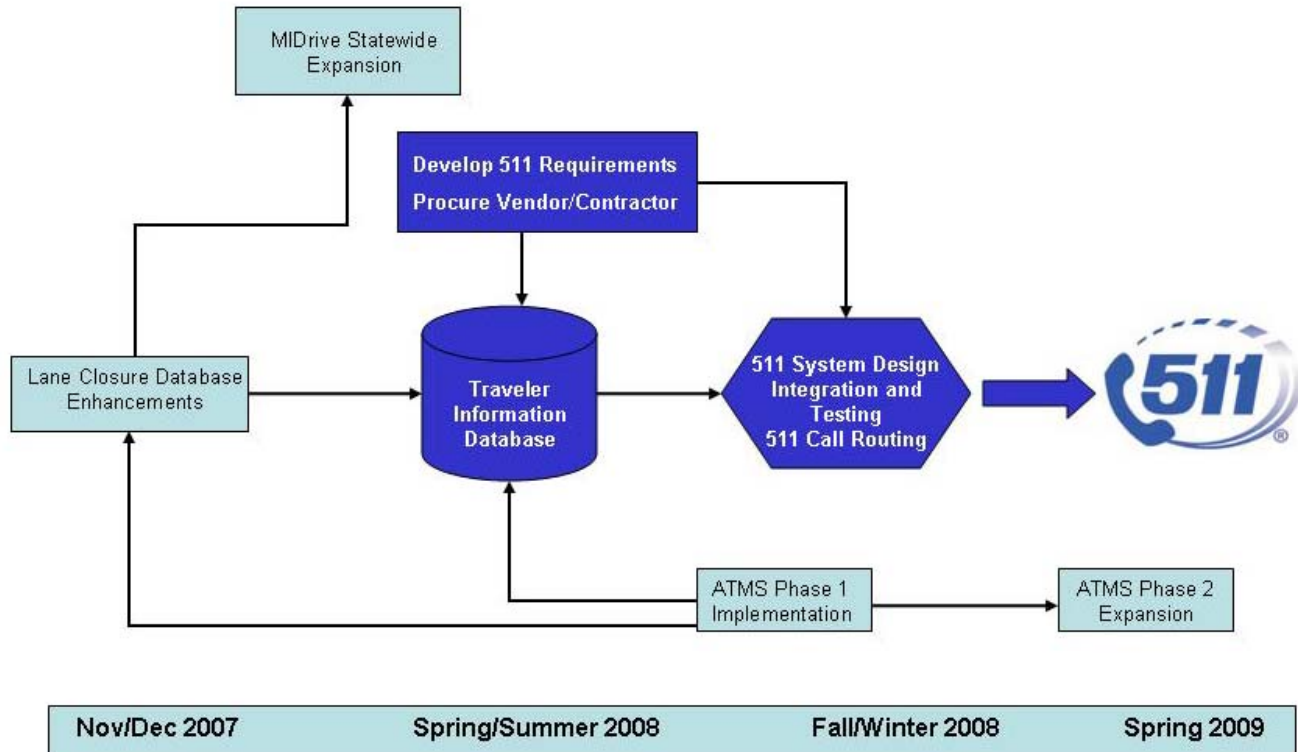


Figure 5 – MDOT Key Activities to Support 511

8.2 Usage Estimates for Michigan's 511 Service

Because 511 cost and operational requirements are usage driven, it is often difficult to forecast actual usage and estimate the cost impact. Several factors will influence usage volume, most notably:

- Level of marketing and promotion of the 511 service
- Seasonal weather impacts, which have had a demonstrated influence on spikes in call volumes in other services

To provide a baseline for estimating the potential usage of Michigan's 511, information from other statewide services was obtained from a recent 511 Coalition-sponsored study. **Table 8** shows operational data for six statewide systems, including number of months the system has been in operation, average number of calls per month, and peak month totals. Although these represent mature 511 services, they do provide some good context for assessing potential usage in Michigan. Most of these states also experience significant winter weather impacts. Population numbers are also provided – it is important to note that Michigan's statewide population is higher than any of these systems shown here. Data is based on the 511 Coalition performance monitoring activities. The Coalition has not been maintaining the monthly usage tracking, hence data provided represents the most recent Coalition reporting numbers from October 2006.



Table 8 - Summary of Selected Statewide Systems (Coalition Data, October 2006)

State	Population	Hosting	Months Operational	Calls (Total)	Average Monthly Call Volumes	Peak Month
Utah	2,351,467	Hosted	60	1,763,152	29,386	138,833
Arizona	5,580,811	In-House	56	2,615,263	46,701	167,969
North Carolina	8,407,248	Hosted	27	1,347,181	49,896	154,840
Virginia	7,386,330	Hosted	20	2,131,121	106,556	161,690
Kansas	2,723,507	Hosted	34	776,171	22,829	129,652
Washington	6,131,445	In-House	50	3,252,938	65,059	421,600

Given this historical performance data from other states, and factoring in Michigan's statewide population, an average call volume of 75,000/month for a Year 1 scenario would be a reasonable estimate. This equates to approximately 900,000 calls in the first year. This average accounts for lower call volumes in the spring and summer months, and likely increased usage during winter months due to road weather impacts.

Beyond Year 1, some states have reported steady growth in usage (15-20%), while others have seen increases in the 30-40% range. Applying a mid-range growth factor of 30% per year following the initial implementation, an estimate of call volumes and usage (minutes) is provided in **Table 9**. This table includes a pro-rated estimate for Year 1, assuming a public launch in the Spring of 2009.

Table 9 - Call Volume and Usage Estimates for Michigan's Statewide 511

Usage Estimates	Year 1 Basis	Year 1 Pro-rated	Year 2	Year 3
# of calls to 511	900,000	675,000	1,170,000	1,521,000
Minutes used	1,602,000	1,201,500	2,082,600	2,707,380

**Minutes were calculated using a 1.78 minute per call average. This average was calculated based on an average of other statewide 511 per call minutes, as reported by the Coalition.*

Both call usage volumes as well as minutes are significant, particularly if MDOT is going to contract with a provider to operate its 511 service. Contract arrangements vary from a flat rate, to one that is based on a certain number of ports, calls, minutes, or a combination the three. Although a key benefit of contracted operations is the flexibility to be able to accommodate sudden spikes in usage, there needs to be a baseline number agreed upon, and then the contractor will typically make additional ports or lines available when call volumes temporarily 'burst' the baseline.

8.3 System Cost Estimates

The estimated cost to design, build, implement, operate, maintain, test, market, and enhance Michigan's 511 service will be approximately \$3.8M over a three-year period, which includes:



- Preliminary activities to develop requirements, select and negotiate with a contractor for system development
- System design, integration, and implementation
- Operations for two years beyond the initial implementation

These planning-level cost estimates are based on the usage numbers shown previously, and incorporate known telecommunications routing/switching charges. Because Michigan is developing their statewide database in-house, those costs are not reflected in this estimate.

This cost estimate can be broken down into the following three types of cost, as shown in Table 10. Dates provided correspond to the project deployment schedule, shown in section 8.4.

- Year 1 (Calendar 2008) – Includes primarily system design and development, with minimal operations. Telecommunications call routing is included with Year 1 costs. Marketing planning is also included.
- Year 2 (Calendar 2009) – Includes public launch and first year of system operations (although on a pro-rated basis). Year 2 assumes continued enhancements to the MDOT Traveler Information Database for interfaces with various systems, including Lane Closure Database, ATMS, RWIS, and potentially other data types. Ongoing enhancements of the IVR are anticipated to address minor issues. Marketing will continue.
- Year 3 (Calendar 2010) – second full year of operations, assumes 30% growth in call volumes over the basis first operational year (year 2).

Table 10 – Projected Funding Needs By Year

Task/Activity	Year 1	Year 2	Year 3
511 Detailed Requirements/RFP	\$25,000		
Telephony/IVR			
New IVR System Design/Development	\$500,000	\$100,000	\$100,000
Existing MDOT Traveler Information Database	\$50,000	\$25,000	\$25,000
System Interfaces and Integration	\$25,000	\$25,000	\$25,000
Telecommunications Call Routing	\$250,000	\$15,000	\$15,000
Operations and Maintenance	\$150,000	\$775,000	\$1,345,500
Marketing	\$30,000	\$90,000	\$25,000
FTE - Statewide ATIS Coordinator	\$75,000	\$75,000	\$75,000
Annual totals	\$1,105,000	\$1,105,000	\$1,610,500
3-year total			\$3,820,500

These costs do not reflect the MDOT costs and staff time for development of the Lane Closure Database enhancements, MIDrive or the ATMS.

Several factors could influence the initial cost estimate:

- Call volumes in excess of the estimated amounts for years 1, 2 and 3
- Reduction in routing charges as a result of negotiating with telecommunications carriers, particularly AT&T and Verizon landline (this cost estimate does not assume monthly recurring charges)



- Ongoing enhancements in Years 2 and 3. Some development has been accounted for in the IVR and Operations and Maintenance because there are anticipated additional systems and technologies that will come on line which will interface with the 511 service.
- Acquisition of private sector traffic flow/speed data on corridors not covered by MDOT sensors.

Another potential impact to costs would be if MDOT opted for an in-house system versus a contracted system. Cost estimates for some components were developed assuming a contracted operation. In the 511 Coalition Report, “511 Deployment Costs: A Case Study”, six statewide systems were assessed in terms of cost-per-call. These costs ranged from less than a dollar to nearly \$2.50. The average across these six states was \$1.15/call. This was used as the basis for estimating potential O&M costs for Michigan.

To provide some perspective from other statewide systems, the following table outlines costs for initial development and implementation as well as operations and maintenance.

Table 11 – Summary of Overall Costs for Statewide Systems

System	511 Activity (shown in \$)			Total
	Planning and Design	Implementation	Annual O&M	
Utah	388,108	792,500	556,000	1,747,608
Arizona	414,909	1,057,522	347,427	1,819,888
North Carolina	724,326	939,124	1,529,007	3,192,457
Virginia	1,572,700	1,647,000	2,006,350	5,226,050
Kansas	461,264	422,403	108,505	992,172
Washington	N/A	948,000	268,750	1,261,750

(Source: *511 Deployment Costs: A Case Study*, The 511 Deployment Coalition, 2006)

To provide some context, the following are included in the aggregated costs for the identified categories:

Planning and Design (pre-implementation) phase includes all the necessary activities involving planning and design of the 511 system before the actual implementation can take place. In some cases, enhancements to legacy systems (such as statewide databases) are included.

Implementation phase - initial investments in IVR system development and interfaces to data sources, servers, associated software and application upgrades. This category also includes telecommunications routing costs and marketing costs (launch and other initial marketing efforts).

Annual operations and maintenance (O&M) phase represents the all the on-going annual 511 operations related activities after the official launch of the system. These may include recurring charges from telecommunications carriers, ongoing marketing activities, and performance monitoring.



8.4 Deployment Schedule

The schedule shown at the end of this section provides a three-year deployment and implementation view for the 511 service and associated systems. This schedule is divided into calendar years, and is assuming selecting a contractor to develop and operate the system in the first quarter of 2008. 2007 and early 2008 include key pre-deployment activities, such as developing requirements and procurement documents, selecting and negotiating with a contractor, as well as internal activities that are already underway between MDOT and DIT to enhance the statewide lane closure database as well as expand the MIDrive website to include statewide road conditions information.

This schedule shows the public launch of the statewide MIDrive occurring mid-year 2008, and the public launch of the 511 service in early 2009. To allow sufficient time for 511 system development, integration and testing, it is recommended that MDOT allow for a three-month burn in period (“soft launch”) following system testing. This will allow time to work through any operational issues prior to making the public aware of this service. If the contractor is able to complete system design and testing earlier than noted on this schedule, a launch can occur sooner than Spring 2009. MDOT might want to weigh the impacts of launching 511 during the height of winter driving season, or deferring a public launch to occur prior to the summer construction season.

8.5 Resource Requirements

Implementing a 511 service in Michigan will require a long-term commitment to fund, operate, and maintain this traveler information resource. MDOT is already making substantial investments in MDOT-supported traveler information, including the MIDrive web site, planned enhancements to the statewide lane closure database, as well as a vision to integrate more real-time data into traveler information systems through the ATMS implementation. These kinds of traveler information tools will require an investment of resources – including funding, inter-department coordination, staff, and partnering. The following describes the key resource requirements recommended as part of Michigan’s 511 implementation and expansion of its traveler information tools and programs.

- Ongoing coordination with MDIT for continued enhancements to the key supporting systems, including integration of the ATMS, Lane Closure Database, future RWIS and other data sources. MDIT will be an important resource for establishing the important data servers to feed both the phone and web traveler information systems. Even with a contractor on board to develop and operate the 511 IVR, DIT will serve as a key partner to provide technical expertise and support to provide the platforms for data exchange between MDOT and the private partner.
- MDOT will need to coordinate with and involve contracts and procurement to develop an RFP to hire a contractor/vendor for 511 system design, integration and operations. Furthermore, any future partnering arrangements with private sector (such as for data obtained through private partner infrastructure or systems) will require review and monitoring of agreement language. As MDOT expands its traveler information tools to include data or information from additional public sector agencies in Michigan, it is recommended that formal data sharing agreements be established. While these will likely be zero-dollar agreements, it will still be important to establish the operational parameters, how data will be utilized, and roles and responsibilities for both sides.
- Processes and procedures for MDOT’s lane closure database for data entry, monitoring and operations will need to be established and utilized statewide. It is recommended that MDOT



and MDIT develop standard operating procedures for MDOT regions to follow when entering information into the lane closure database, which will then feed the phone and web statewide traveler information systems. Consistency of information entered into these systems is paramount to the success of MDOT's traveler information program.

- It is recommended that MDOT identify a statewide Traveler Information Manager/Coordinator to serve as the central contact for 511, MIDrive, contractor coordination, working with private partners, and liaison with other departments for operations and enhancements to the statewide traveler information tools (including the ATMS and Lane Closure Database). This statewide traveler information coordinator would also represent MDOT with national 511 coalition activities. Several states have found significant benefit in assigning a central point of contact for traveler information; Virginia, Tennessee, Kansas, and others each have a statewide traveler information position. While 511 is a big part of their job responsibilities, there are other facets to a statewide traveler information system that this position will be responsible for. These could include managing the partnerships that support the traveler information program, both public and private. This way, there will be a central point of contact to handle any arrangements for sharing data, identifying opportunities to expand the system, and coordinating with other departments for system enhancements and upgrades.

Figure 6 – Michigan 511 Development, Implementation and Operations Timeline

